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COLLECTIVE REVIEW

GUNSHOT WOUNDS IN THE PRESENT WAR

By Colonel LOUIS A. LaGARDE, Medical Corps, U. S. A., Retired

IT may well be said that military surgery has never before held the important place with the medical profession that it does at this time. In a review of the subject it first becomes necessary to describe briefly the causative agents in the production of war wounds; then to consider the characteristic features of the wounds, infection, general treatment, and a brief résumé of wounds in certain anatomical parts.

PROJECTILES

All the warring nations, with the exception of France, England, Germany, and Turkey, use an ogival, reduced caliber bullet with approximately the following salient features: caliber, 0.30; length, 4 calibers; weight, 220 gr.; velocity, 2,000 f.s.; striking energy, 1,954 ft. pounds; penetration in green oak across the grain, 28 inches. The rifling, describing one complete turn in 10 inches, imparts a rotary motion to the bullet at the rate of 2,400 turns per second, which tends to keep the projectile point on during its flight. The bullets are of the mantle type, being composed of a jacket of steel containing a hard lead core, exposed at the base only.

The French, unlike all the other nations, use a solid biogive-shaped bullet, the fore ogive being pointed while the rear one is slightly truncated. The projectile is 8 mm. in caliber; 39 mm. long; and weighs 12.8 grams. The bullet is composed of one solid piece of bronze, and not steel-jacketed.

The German and Turkish bullets are virtually the same: caliber, 0.30; length 1.25 inches, or barely 3 calibers; weight 150 gr. The elongated point comprises about three-fourths of its total length. This pointed spitze bullet has increased the danger space to something like 750 yards, due to the flattening of its trajectory, a fact made possible by decreased air resistance.

The English bullet is similar to that of the Germans and Turks, except that the core is made up of two separate metals, i.e., aluminum and lead, the lead being in the base and the aluminum in the point. Other agencies causing war wounds are shrapnel, shell fragments, grenades, and bombs. Pistol and revolver wounds are so infrequent in this war that they will be given no space here.

CHARACTERISTIC FEATURES OF WOUNDS

The characteristic features of war wounds are influenced by the size, shape, and velocity of the missiles which inflict them. Wounds from grenades, shrapnel, shell fragments, etc., usually cause excessive laceration, contusion, and hæmatomata, conditions favoring intense infection.

The characteristic features of wounds from the ogival-headed and the pointed bullets differ so widely at times that they will be discussed separately. In the Spanish-American, Anglo-Boer, and Russo-Japanese wars the ogival-headed bullet was referred to as a humane bullet, because on penetrating soft parts and joint ends of bone the track was only slightly larger than the sectional area of the missile. These wounds, having only a slight amount of trauma, healed rapidly. Even those in joint ends of bone, formerly the bugbear of the military surgeon, healed rapidly under clean dressings and im-

mobilization. In the case of skull wounds, wounds of the diaphyses, or of cavities containing fluid or semifluid matter the wound was attended with more or less destruction of tissue, especially in the proximal ranges. Sometimes under these conditions the effects were termed as being explosive in character.

Due to the fact that the French bullet is one solid piece, that it does not fragment, and that it is better balanced than those used by the Germans, English, and Turks, the wounds caused by this projectile are not attended with as much laceration of soft tissues or splintering of bone.

The Turks, using the illy balanced pointed bullet, in the Turko-Balkan War caused humane wounds in soft parts and, contrary to previous ideas based on its superior penetration, it was found to lodge in a large majority of cases. This was most likely due to the fact that this war was fought at battle ranges where explosive effects are absent and the remaining velocity of the projectile low. Observers were unanimous in reporting that this bullet turned side on when encountering the least resistance, a fact adding greatly to the mortality of head and abdominal wounds.

In the present war both English and French observers have remarked on the unstable character and the destructive effects of the German spitze bullet. It should be remembered that most of the fighting is being done at close range — within the range of explosive effects — and behind entrenchments. On striking dense bone this bullet tends to turn side on, throwing out the lead contents, which, with fragmentation of the now empty envelope, bone spicula and bone sand, cause great laceration and destruction of tissue, as each of these particles acts as an independent secondary projectile. These wounds are always badly infected from the beginning.

The double nucleus of the English bullet has been the subject of much controversy recently. Von Bruns (2) believes that doubling the nucleus adds to the tendency to fragmentation and that the effects are nothing short of those observed from dumdum bullets. To increase the stability of their bullet the English lengthened it, using the lighter metal so as not to materially increase its weight. I believe that they have a more stable bullet by so doing and that its disintegration is caused only in the same way as the other pointed bullets. It is doubtful if more wounds showing dumdum effects are found on the German than on the English side. It was a grievous error to have adopted a pointed bullet at all from a humane point of view, but the tacticians and ordinance departments did so because of its lighter weight, decreased air resistance, and therefore increased danger space.

INFECTION OF WOUNDS

Infection of gunshot wounds and wounds in general has been exceedingly prevalent during the present war. Generally the infection is caused by the bacillus of Nicolaier or that of Welch, complicated by streptococci and staphylococci. Fleming believes that the staphylococcus albus favors the development of the bacillus of Welch and promotes the incidence of gas gangrene.

Observers at the front find that the bacilli of Welch and Nicolaier may abide in a great variety of wounds without clinical manifestations, their growth being more luxuriant in wounds attended with a special amount of laceration, contusion, and devitalized tissue.

TREATMENT OF WOUNDS

First-aid treatment at the front is not receiving much favor, but it would seem that if the skin were first sterilized with tincture of iodine, half strength, much more favorable results would be obtained. Those familiar with the widespread infection in contused and lacerated gunshot wounds have never advocated the use of a skin disinfectant and a first-aid dressing with the hope of removing the deep-seated infection.

The chief difficulty in the care of war wounds is the inability of the military surgeon to control environment. In civil practice every facility is at hand at once, while in war time it is hours and often days before the case can be brought under control for proper care and treatment, and during this time infection often spreads and becomes systematic.

As to the management of grave wounds with bone involvement there seem to be two schools: one prompted by the teachings of Sir W. W. Cheyne (3) and the other by Sir Almroth E. Wright. Cheyne believes that these infections are easily controlled by the stronger antiseptics, such as pure carbolic acid or some of its stronger dilutions. He states that the hopeless view of some surgeons of removing infection from this class of cases "is probably founded on experiments by LaGarde and others carried out a good many years ago." In these experiments, reported first in 1901 (4), the writer showed that carbon particles placed on the skin of an animal were driven into the soft tissues a distance of 17 mm. when the animal was fired into with a

0.45 caliber bullet from the old Springfield rifle. From this it was inferred that micro-organisms could likewise be driven into the tissues. Carbolic acid, as Cheyne believes, may be the most diffusible antiseptic but it is doubtful if its diffusibility is equal to the task of reaching throughout the extensive infected area of a compound gunshot fracture showing explosive effects.

Wright is very much in accord with the views entertained by most surgeons. He believes that a projectile carrying infection, filth, etc., into the wound "will implant them far beyond the reach of any prophylactic application of antiseptics." He advocates the use of early and free drainage; lymph lavage by the use of fermentations which induce active hyperæmia. In addition he employs a hypertonic irrigating fluid composed of 0.5 per cent of citrate of soda and a 5 per cent solution of salt.

Dakin and Carrel (5) have advocated the use of a new antiseptic which is made by mixing solutions of sodium carbonate and chlorinated lime. This solution is filtered, and to the clear liquid, boric acid is added to slight acidity. The reports from the use of this antiseptic are very encouraging.

Tuffier, consulting surgeon to the French armies in the field, divides the cases of gas gangrene, due to the welch bacillus, into two clinical varieties: (1) hyperacute gangrene, which spreads with great rapidity and ends fatally within 24 hours, a variety which is beyond the control of the surgeon; (2) a superficial gaseous gangrene which spreads in the cellular tissue under the skin and is amenable to treatment when early and free incisions are made to relieve the constriction.

Injection of oxygen or peroxide of hydrogen into the cellular tissue has also been used with good effect. The lower limbs are more frequently affected than any other part of the body.

The reporters find that tetanus is much less frequent now than it was at the beginning of the war. It has become the common practice to immunize all wounded with antitetanic serum.

Shock is naturally among the more important symptoms of gunshot wounds. Tuffier recommends the use of morphia hypodermatically in the treatment of shock, and attention may also be called to the splendid results obtained in the Russo-Japanese War from the use of the following mixture hypodermatically:

Camphor	1 part
Ether	4.5 parts
Olive oil	4 parts

Incision and excision. As a new feature of treatment, Milligan and others have obtained good results, in specially selected cases, by excising the infected and devitalized tissues and then suturing the wound.

Hæmorrhage. External primary hæmorrhage is seldom seen in the present war. It is naturally controlled by ligation and constriction at the front. Secondary hæmorrhage, however, is more common because of the prevalence of infection. In aseptic cases Tuffier applies ligatures to both ends of the injured vessel in the wound, while in infected cases he ligates the artery on the proximal side in healthy tissue. Arterial and arteriovenous aneurisms are best treated by longitudinal suture. Spontaneous cure is not uncommon. Treatment of aneurismal varix and varicose aneurism is the same as that of other forms of traumatic aneurism; i.e., rest in bed, immobilization, etc. The operative treatment depends on the vessel affected and the amount of disturbance present.

Gunshot wounds of the head. The proportion of head wounds to wounds of other parts is greater than formerly. With the old tactics, where battles were fought in the open, it was 8 per cent of all wounds. In more recent wars — the Anglo-Boer, Spanish-American, etc. — it ranged from 15 to 20 per cent, while in the present war with the great amount of trench fighting the percentage is expected to rise even higher.

In all head cases, especially the minor ones, careful examination should be made for any disturbance of cerebral function. This is especially true of the tangential shots with the new rifle bullet, as it is very prone to fracture the inner table without mutilating the outer table.

Roberts (6) recommends excision of the scalp wound beyond the contused area. When fracture is discovered and lacerated brain tissue is found the parts should be explored, all foreign matter including bone fragments removed, and the wound closed with or without drainage. Urotropine (gr. xx., t. i. d.) should be given in all head cases from the date of admission. In penetrating wounds of the head this treatment is applicable to the wounds of entrance and exit.

Gordon Holmes and Percy Sargent (7) have published their observations on symptoms of injury of the longitudinal sinus, which deal with conditions rarely seen in civil practice. In fracture, especially from tangential shots, venous disturbance, due to the superficial course of the cerebral veins, is very common. Striking clinical effects are noted when the sinuses, into which the veins flow, are afflicted. In ordinary hemiplegias the fingers, then the hands, wrists, etc., suffer most and recover more slowly, but in hemiplegias

from sinus involvement the reverse is true. The fingers may escape entirely or be only slightly involved and when involved the paralysis disappears rapidly.

Tuffier states that most of the French surgeons treat gunshot fracture by immediate trephining. Transport of these cases is prohibited until they are out of danger. Removal of lodged missiles should not be attempted unless located in accessible parts of the brain by X-ray or other reliable means.

The painstaking efforts to eliminate and prevent sepsis in brain injuries will greatly decrease the mortality in these cases by preventing complications like hernia cerebri, brain abscess, etc., conditions usually ending fatally.

Gunshot injuries of the spine. The present war has added little to the knowledge obtained since the advent of the reduced caliber military rifle. The amount of energy conveyed in the form of vibratory force through the bony framework of the spine is responsible for certain temporary, though sometimes permanent, pathological conditions resulting in functional changes. The bullet does not necessarily enter the spinal canal in these cases. The transmission of vibratory force causes a traumatism which ends in destruction of the cord with all the symptoms of a transverse lesion.

Peripheral nerves. Delorme (8) and others advocate immediate resection and suture of injured nerves, but this plan has not been adopted as a rule although it is applicable when one finds a divided nerve in the field of some other operation. Under strict asepsis a divided nerve may be sutured at the time of the primary dressing. Observers note an increased number of divided nerves in this war, due no doubt to the readiness with which the new bullet key-holes, and to wounds from sharp shell and grenade fragments.

Gunshot wounds of the chest. Wounds of the chest, since the adoption of the new military rifle, were classed as humane until the introduction of the spitze, or pointed, bullet in the Turko-Balkan War of 1912. Increased use of shrapnel has also caused a great increase in the mortality in this class of cases. Wounds from shrapnel are likened to those due to the old armament used in the Civil and Crimean wars when the mortality was rated from 62.5 to 91.6 per cent. The principal dangers in chest wounds are complications such as pneumothorax, hæmothorax, and infection. Pus should be evacuated as soon as discovered. Hæmothorax, unless large, needs no operative interference.

Penetrating and perforating wounds of the abdomen. The divergent views formerly held by civil and military surgeons on the operative treatment of these wounds have, to a large extent, disappeared in the present war. The wounds caused by the reduced caliber bullets in recent wars gave the impression that a certain proportion of abdominal wounds were so benign that they naturally recovered without operation, although the wounds of entrance and exit pointed to visceral involvement. This happy outcome was attributed to the passage of the projectile between knuckles of gut without opening the lumen, but we now know that the benign character of these wounds is due mainly to occlusion of perforations in the gut by eversion of the mucosa.

The greater use of shrapnel and the pointing of the rifle bullet have increased the mortality of abdominal wounds. Many observers comment on the relative scarcity of abdominal wounds in the field hospitals, the inference being that the large majority of this class of wounded do not live long enough to reach the field hospitals.

Gunshot injuries of joints. The introduction of the unstable pointed bullet and the greater use of field artillery is increasing the severity of this class of wounds as compared to those caused by the ogival-headed bullet. In 17 cases (9) of gunshot wound of the knee in the Santiago campaign by ogival-headed reduced caliber bullets, there were neither deaths nor amputations and 81.1 per cent were restored to duty. It is doubtful if such a record of good results will ever be duplicated with the use of the present armament.

Tuffier finds that rifle bullet wounds of the knee-joint usually heal kindly, but injuries of this class caused by shrapnel or shell fragments are prone to suppurate and undergo ankylosis after prolonged convalescence. He prefers resection of the joint to amputation because reamputation or other secondary operation was necessary in 10 per cent of the cases observed. Through and through drainage is the rule in the presence of infection. Excision or amputation is in order when suppuration fails to yield to persistent treatment.

Gunshot fractures of the long bones. In these fractures the three prime requisites are drainage, immobilization, and frequent redressings. In this, as in all other wars, infection in fractures consumes the most of the surgeons' time, and it is pretty constant in bone injuries.

Amputation by circular plane section. This form of amputation was revived again in the

early part of the war in some cases of gas gangrene for the following reasons: (1) It is the quickest method, a valuable point when there is great prostration. (2) The wound is open. (3) It is only a temporary measure and everything can be righted by secondary operation if necessary. With facilities and sufficient personnel it is not necessary to pursue this ancient method.

IMPORTANT FACTORS IN THE PRESENT WAR

Sir Anthony Bowlby (10) brings out the wide difference observed in the pathogenic conditions of war wounds in the Anglo-Boer and the present European war, based on the nature of the terrain in the two wars. In South Africa the battles were fought in an open country, sparsely settled, and but little cultivated. The climate was dry and sunshine was prevalent throughout the year with rare exceptions. The pathogenicity of wounds was not of special significance. Tetanus and gas bacillus infections were seldom seen.

In Belgium and Northern France, the scene of Bowlby's recent military experience, the terrain is thickly inhabited by a population devoted to agricultural pursuits and the raising of live stock. The climate is damp, and sunshine is as rare as cloudy days are in Africa. The soil is necessarily a prolific incubator for all kinds of aerobic and anaerobic microbes. Contamination of gunshot wounds in soldiers wearing clothing laden with the dust and mud from such a terrain is the rule. Another factor which has prevailed in the present war to add to the frequency of infection in gunshot wounds is the wide difference in the characteristic features of the wounds themselves. In a general way the wounds in the South African War were very much less severe. They were inflicted by ogival-headed bullets in the large majority of cases, at battle ranges which approximated a half-mile. The bullet was well balanced and generally made a regular impact. Wounds in the soft parts, the joint ends of bones, and lungs were very infrequent in the Boer War, and less severe than those which occur in the trench fighting in the present war.

CHARACTER OF MISSILE

The character of the missiles used in the present war is more varied than in any previous war. It is not yet possible to give the proportion of wounds by rifle bullets, but the fact that the bullet is employed by the hand rifle and machine gun of all of the combatants will make bullet wounds, as usual, the most frequent in war. The instability of the pointed bullet as compared to the ogival-headed bullet has a tendency to produce lacerated wounds when the shot is delivered at close range or when the bullet turns, a thing it frequently does, at the moment of impact. The pointed bullets of the Germans and English are very much the same in ballistic value, and Bowlby very much doubts if either bullet disintegrates from the resistance which it encounters in the bony framework of the human body. His idea is that deformation and disintegration of bullets are most generally found as a result of ricochet shots. The French bullet, made up of a copper compound and having neither core nor mantle, is solid and homogeneous throughout. It is longer and heavier than either of the other bullets, but it is doubtful if the nature of the wounds it inflicts is different from that inflicted by the English or German bullets.

In addition to bullets, there are a number of other forms of missiles to be considered.

1. Shrapnel shells contain from 250 to 400 round bullets of lead which are soft in some shells and hard in others, of an average diameter of one-half inch. Each shell is provided with a time fuse to burst in the air over the object aimed at. The bullets are propelled in a cone-shaped stream and the violence of their impact is proportionate to the velocity of the shell at the time of bursting. Wounds may also be caused by the metal case, which is a foot in length and weighs several pounds, but the character of the wound it causes does not differ from that produced by the ordinary shell fragment. The velocity of the round bullets is never so great as that of the hand rifle bullets, and their effective range is never as great.

2. High explosive shells vary in weight from a few pounds to about one ton and they consist of a thick iron case, containing in a central cavity a violent explosive charge. In the German shell the charge is 200 pounds of trinitro-toluene. The shell is made to burst on percussion by a detonator. The injury caused by these shells is from jagged fragments into which the shell breaks up at the moment of impact, as well as from portions of buildings, when pieces of stone or brick are scattered broadcast with immense force. The expansion of the gases is also sufficient to either kill or disable those in the vicinity of the explosion.

3. Bombs, hand grenades, rifle grenades, trench mortar bombs, etc., are all made of a case of iron or other metal containing a large charge of high explosive. The bomb case is composed of iron about one-half inch thick, which is at times incompletely divided into segments one-half inch square. The German grenade is

composed of thin steel or other metal. The fragments which issue from the explosion are very numerous and small; some of them are pointed and with an edge like a knife; others are quadrilateral. The German bombs contain irregular jagged pieces of loose metal — rough iron boot nails one-half inch long and pyramidal in shape.

All forms of shells and bombs scatter various kinds of extraneous matter from the vicinity of parapets, like stones, earth, pieces of timber, gravel, sand, etc., which are apt to injure more especially the head, face, neck, and shoulders of soldiers standing in the trenches.

CHARACTER OF THE WOUNDS

Bowlby's description of characteristic features of proximal shots from the military rifle bullet, which show all of the lesions that mark so-called "explosive effects," is by far the most striking part of the Bradshaw lecture. The writer is able to comment feelingly upon this part of the lecture because it describes in detail the observations of the early investigators who resorted to the shooting gallery and simulated ammunitions in experiments on cadavers to determine the effects of the new armament on the human body. Those of us who, 20 years ago, described the horrible effects on the cadaver which Bowlby has so recently seen in actual war, were then accused of exaggeration. The frightful effects described were attributed to the result of firing in putrid flesh. The German, French, English, and American experimenters who first tried the high-power military rifle did so by shooting into cadavers with simulated charges. They fired at a fixed range and reduced the charge of powder, thus giving the bullet the remaining velocity which it should possess, all the way from 50 to 2,000 yards. In the early tests of the Krag-Jorgenson rifle, which were made in this country, results of which appeared in the annual report of the Surgeon-General of the U. S. Army in 1893, the explosive effects described therein tally exactly with the highly destructive effects of the Lee-Medford, Lebel, and Mauser rifles of the foreign experimenters. All of these reports are in accord and the horrible effects described in the Bradshaw lecture stand out forcibly as a vindication of the work of those early investigators. The experimenters knew whereof they spoke when they described the effects of proximal shots, and they were never in a position to compare their experiments with battle wounds, because the latter, in all wars before the present European war were received at battle ranges averaging one-half mile, where explosive effects are unknown. It has taken a quarter of a century to convince the "doubting Thomases" of the highly destructive effects of the reduced caliber military rifle at close range, which can be seen daily in the trench fighting now going on in Flanders and Northern France.

Bowlby states that the wounds in the present war are as varied as the projectiles themselves. The "normal" bullet wound so common in the South African War, characterized by a tiny aperture of entry and exit, is seldom seen in the present war. Bullets "tear the soft tissues to rags and blow out the muscles and fascia through great rents in the skin." When a large bone is struck the damage is yet greater, the wound having the features of laceration observed in a wound caused by a shell fragment. "This is due to the fact that the bullet traveling at the height of its velocity not only smashes the bone, but also imparts its momentum to the shattered fragments and drives them in every direction, so that the injury to the soft tissues is inflicted in great part by the fragments of bone themselves."

Wounds by shrapnel bullets are not so extensive; they more frequently lodge, and they are often multiple. The wounds caused by high explosive shell fragments, bombs, and grenades are so varied that it is not possible to describe any of them as a type. They are all ragged and lacerated. The large fragments tear away limbs or huge masses of skin and muscle. The neighboring tissues show widespread contusion and extravasation of blood. Wounds by smaller shell fragments and from bombs and grenades are lacerated in proportion to the size of the fragment and they are nearly always multiple. The wounds in this war stand out very distinctly as a class by themselves among war wounds and they have none of the features of the wounds inflicted in civil life. The traumata concerned in the causation of the latter tend to produce injury to the tissues by slowly crushing them from without; whereas in all penetrating wounds by bullets and missiles of all kinds moving at great speed the injury is produced by a divulsive or expanding force acting from within. Bowlby adheres to the older theory that the injury "is largely due to the wave of compressed air which the bullet drives in front of it and which expands within the tissues." This assertion comes as a surprise since the writer has always felt that the theory of compressed air as a factor in the causation of destructive effects in gunshot wounds had been exploded long ago. It is inconceivable that very much of a cushion of air can accumulate on

Fig. 1. Destruction of the elbow-joint by a bullet wound. Gas gangrene. Paralysis of median and musculospiral.

Fig. 2. Radiograph showing enormous projectile, a cartridge of a Lebel rifle.

the tip of a spitze bullet when we remember that the latter tapers to a distinct point.

MICROSCOPICAL EVIDENCE OF WIDESPREAD INJURY

Very interesting data are presented as regards the widespread injury to soft tissues, such as muscle-fibers, kidney and liver structure, as shown by necrotic changes and extravasation of blood extending as far as three inches from the channel of the gunshot wound. Microscopic sections of kidney tissue showed great vascular engorgement of the capillaries some distance beyond the apparently injured tissues. For the microscopic appearances of the tissues that surround the channel of a gunshot wound in soft parts only, with the transmission of carbon particles placed purposely upon the skin of animals before firing into them, the writer begs to refer the reader to the Mueller lecture already referred to.

OTHER FAR-REACHING EFFECTS

The author reports two cases which show the mutilating effects that can occur by the lateral energy of a bullet when it is transmitted in the form of vibratory force: (1) An officer was shot transversely across the face, the wounds of entrance and exit being below and through the zygoma respectively. Although the track of the bullet was an inch below the level of the base of the skull the latter was fractured, the dura was unhurt, but the frontal lobe and one temporosphenoidal lobe were more or less pulpified. (2) A young officer was shot across the back of the neck; the wound was apparently superficial, but he died in two days. At necropsy it was shown that the bullet had only broken off the tip of the sixth cervical spine, the laminæ were not fractured and the dura mater was intact, yet the cord had been contused and the gray matter was broken up by hæmorrhage. Cases are also cited of hæmorrhage in the spinal cord ending in death when the bullet had passed through soft tissues only in the vicinity of the spinal column; instances are also cited of abdominal wounds with torn intestines from the vibratory force of the bullet in which the peritoneal cavity remained uninjured by the bullet itself.

CONDITION OF THE WOUNDED

A room full of wounded men just gathered from the battle line is usually very quiet as a result of sleep on the part of the majority, and collapse and shock among the rest. Vomiting and retching are frequently found in cases of shock, for which pituitary extract is given, with intravenous injections of normal saline solution and enemas of hot water and brandy.

SECONDARY COMPLICATIONS OF WOUNDS

All gunshot wounds in this war are infected at the time of the receipt of the injury, fæcal microbes and streptococci being the chief offenders. The method of treatment of infection recommended by Sir Almroth E. Wright is also preferred by Bowlby. Wright's references to the bacterial flora of war wounds follow closely the findings of Fleming and others. The anaerobes attack devitalized tissue by preference. "The more severe and extensive the injury, and the more tissues are lacerated and devitalized, the more the wound is likely to be badly infected."

In civil life the patient's environment which is dominated by the surgeon is entirely favorable to life and limb, but in war surgery the inability of the surgeon to control this environment, and the virulence of the infection in badly lacerated wounds, especially in the present war, are very detrimental factors in prognosis. The use of antiseptics in the prevention and amelioration of sepsis in war should be followed as constantly and persistently, whenever it is practicable, as it is in civil life.

Fractures and badly lacerated wounds should receive all the care that it is possible to bestow upon them, bearing in mind that they are deeply infected and that the salvation in such cases depends on free drainage, frequent irrigation with mild antiseptic solutions, and frequent redressing.

The treatment of advanced sepsis in wounds is best met by prolonged immersion in an antiseptic fluid whenever this is possible, or constant irrigation with saline or antiseptic fluids. The saline hypertonic treatment finds its greatest use before the separation of the slough, and up to the time that a granulating surface has appeared. The subsequent use of nitrate of silver and sulphate of zinc is advisable. The hypochlorous acid treatment as advocated by Dakin and Carrel is a most important advance in wound treatment, more especially when used in recent wounds, before suppuration has occurred, and it has to a great extent displaced all other forms of treatment in many of the casualty clearing stations. It is believed to have prevented or arrested the progress of gas gangrene in many instances. It has the faculty of being a non-irritant to the tissues at the same time that its antiseptic value is sufficient to destroy virulent micro-organisms.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Watson, C. H.: An Improved Substitute for Iodized Catgut Sutures. *Surg., Gynec. & Obst.*, 1916, xxii, 114.

In view of the many objections to the general use of iodine in the preparation of suture materials the following brief investigation was undertaken. As suggested by D. Macfarlan, potassium mercuric iodide was selected as the possible ideal germicide. Following Park's method in general, the germicidal power was determined with reference to three types: staphylococcus pyogenes aureus, bacillus coli, and bacillus subtilis. The conclusions are as follows:

1. Potassium mercuric iodide in alcoholic solution in a dilution of 1:1000, has more than ten times the germicidal efficiency of a 1:100 solution of iodine in alcohol.

2. The impregnation of catgut sutures with potassium mercuric iodide, by increasing the tensile strength of the gut, offers a distinct advantage over the similar use of iodine.

3. Catgut sutures impregnated with potassium mercuric iodide, when sealed in tubes with chloroform, show no deterioration when the tubes are subjected to boiling. Since iodized sutures are ruined by such treatment, the superiority of potassium mercuric iodide over iodine as a germicidal impregnating agent is obvious.

Turner, G. G.: The Abuses and Dangers of Drainage Tubes. *Brit. J. Surg.*, 1916, iii, 552.

Turner gives an account of a personal experience with lost drainage tubes and advice concerning the use of drainage in general. A tube can actually drain only some pre-existing cavity, such as an empyema. Apart from that it may keep a tract patent between some deeply situated septic focus and the skin. It is hardly necessary to retain a drainage tube longer than from fourteen to twenty-one days. Very often a counteropening will do away with the necessity of a long drainage tube.

He lays stress on the danger of placing drainage tubes in contact with blood-vessels on account of resulting hæmorrhage, when the vessel becomes eroded. He quotes Weissenbach and Bertier:

1. That simple contact of the drainage tube with the vessel when both are aseptic will cause no ulceration of the vessel.

2. Infection causes an arteritis with the resulting damage to the vessel wall from pressure of the tube.

3. In an infected area it is never advisable to leave a drainage tube in contact with the vessel for more than two or three days.

He advises boiling drainage tubes for ten minutes, immediately before using them, or boiling them and then storing until used in 1:20 carbolic or 1:1000 perchloride of mercury. H. G. Sloan.

Spain, K. C.: and Loeb, L.: A Quantitative Analysis of the Influence of the Size of the Defect on Wound Healing in the Skin of the Guinea Pig. *J. Exp. Med.*, 1916, xxiii, 107.

The authors have undertaken to determine the influence of the size of the wound on the rate of wound healing in the different types of skin, and in this communication they deal with the results obtained in the guinea pig. In one set of animals a thin flap of skin measuring approximately 2 sq. mm. was removed from the ear of each animal, in another set flaps measuring 4 sq. mm. were removed. After 2, 5, 7, 9, 11, and 14 days pieces were cut out in each set for microscopic examination. Three to five pieces were examined at each period, in both the 2 sq. mm. and the 4 sq. mm. series. All the pieces were cut into several sections. The same measurements were made as in the previous investigations. The results are given in a series of tables, and are summarized as follows:

The larger the wound, the more rapidly the tongue enlarges and the earlier the closure of the wound takes place. Larger wounds heal, therefore, more quickly than smaller wounds within the variations in the size of the wound chosen in the experiments.

Both outgrowing of the tongues and contraction of the wound are concerned in the closing of the wound. A marked contraction sets in in the period preceding the closing of the wound and continues over a longer period with gradually diminishing intensity. The contraction, therefore, sets in earlier in the larger wounds. The contraction is also absolutely greater in the larger wound.

During wound healing the mitoses increase first markedly in the old epithelium and only very few mitoses can be found in the outgrowing epithelium during the first two days. Very soon the mitotic proliferation extends to the tongue and the number of proliferating cells may here become greater than

in the old epithelium. With the closure of the wound a sudden fall in the number of mitoses takes place in both series. This fall is greatest in the tongue. Throughout the time of observation the number of mitoses was greater in the smaller wound.

It is probable that the difference in the rapidity in the outgrowth of the epidermal tongues and the resulting difference in the time of closure are mainly responsible for the difference in the variations in mitoses in the larger and smaller wounds. The longer the period of time over which the pull of the epithelium extends, the greater is the number of mitoses in this area. Therefore it is greater in the 2-mm. series. Closure of the wound is followed by a sudden decline in the number of mitoses, especially in the area of the defect.

The size of the epithelial cell and nucleus increases soon after the making of the wound. A maximum is reached in both the larger and smaller wound in the period just preceding the closure of the wound; this maximum is therefore reached earlier in the larger wound. Absolutely the maximal size reached in both kinds of wounds is approximately the same or only a little higher in the larger wounds.

The closure of the wound causes an increase in the number of epithelial rows over the defect. This increase is therefore reached at an earlier period in the larger wound. The increase is greater in the larger wound owing to the greater pressure which the two opposing cell layers exert upon each other in the larger wound. In the old epithelium the maximum in the number of cell rows is apparently reached slightly before the closure of the wounds. It seems that the epithelial movements leading to the closure of the wound start in the old epithelium and extend wavelike toward the wound.

It thus appears that the primary process in the wound healing consists in movements of the epidermis toward the wound; that these movements are carried out with greater energy in the case of the larger wounds; that the pull of the epithelium calls forth mitotic cell division; and that pressure exerted by epithelial cells upon each other leads to a rapid diminution in the mitotic proliferation.

GEORGE E. BEILBY.

Roberts, J. B.: The Etiology of Post-operative or Wound Scarlet Fever. *Med. Council*, 1916, xxi, 32.

The author reports four cases of scarlet fever following operations which he observed. One occurred in a woman of 27 years, twelve days after appendectomy. The second was seen in a boy, 5 years of age, two days after a cleft-palate operation. The third was in a boy of 6, three days after a slight operation on the lip. The fourth appeared two days after a cleft-palate operation.

These four cases are interesting, perhaps, in the study of the question of the real existence of surgical or wound scarlet fever, which is practically the question of the possibility of the scarlatinal virus entering through a surgical wound. The fact that these cases were all examined by skilled men constantly seeing cases of scarlet fever makes the diagnosis irrefutable.

EDWARD L. CORNELL.

Davis, B. F.: The Relation of Morphine to Post-operative Complications and Immunity. *J. Am. M. Ass.*, 1916, lxvi, 252.

Because of the tendency to blame morphine for the occurrence of many disorders which appear during and after operations, a study was made of the records of 469 patients and of the immunity curves of a series of morphinized animals in order to determine the reasonableness of this idea.

The use of a combination of morphine and atropine before operation was found to have but little effect in the prevention of post-operative shock. An attempt was made to trace a relation between morphine administered and post-operative nausea and vomiting, gas pains, and post-operative disturbances of the urinary apparatus. It was concluded that post-operative nausea and vomiting was very little influenced by the morphine administered, but was markedly influenced by the depth and duration of the anæsthesia. Gas pains are determined chiefly by the tissue involved in the operation, peritoneal trauma being followed by tympanites in about 45 per cent of cases. The general anæsthetic also has some influence. Ether and peritoneal injury are the two important causes of post-operative retention of urine. Morphine plays a negligible part in the production of these conditions. In experiments on morphinized and control animals no constant difference was noted between the activity and opsonizing power of the leucocytes and serums from these animals. There was, also, no suggestion of the effect of morphine upon the hæmolytic curve. Morphine, preceding local anæsthesia, added nothing to the efficiency of the latter and caused post-operative nausea and vomiting in 25 per cent of the cases.

The conclusions are drawn that the pre-operative use of morphine should be abandoned, but that the post-operative use of the drug in doses of from one-eighth to one-sixteenth of a grain at six-hour intervals may be permitted when the suffering of the patient demands it.

E. K. ARMSTRONG.

ANÆSTHETICS

MacGowan, G.: Local Anæsthetic. *Calif. St. J. Med.*, 1916, xiv, 6.

A local anæsthetic to be satisfactory must be capable of producing a perfect anæsthesia of the skin and retain its inhibitive power for a reasonable time, without disagreeable after-effects, either local or constitutional. A local anæsthetic must not of itself cause pain, and to obtain the full anæsthetic effect without injury to the tissues it is necessary that the solution used be isotonic with the body fluids. A 0.9 per cent solution of sodium chloride is isotonic with human blood and should be used in the preparation of solutions for local anæsthesia.

The local anæsthetic agents in the market are cocaine and its derivatives, α- and β-eucaine, holocaine, aneson, and acoine; the orthoform group, orthoform, new orthoform, nirvanin, anæsthesin, subcutin, propaesin, and zykloform; the amido-alcohol group, stovaine, alypin, and novocaine; antipyrin and chloride of quinine and urea.

Cocaine has been largely abandoned as a local anæsthetic because of the frequent occurrence of poisoning and death, the impossibility of sterilizing it without deterioration, and the short duration of its analgesia. Tropococaine, a synthetic product, lacks the vasoconstrictor properties of cocaine, but is the ideal agent for spinal anæsthesia. The other members of this group have nothing to recommend them with the exception of holocaine which is useful in the treatment of corneal ulcers and foreign bodies in the eye, as it anæsthetizes without dilating the pupils.

The members of the orthoform group are powders with anæsthetic properties when brought into contact with nerve-endings. They are used as dusting powders, suppositories, or salves. Anæsthesin is the most efficient and is of use also in painful affections of the upper digestive tract.

Of the alkaline esters stovaine has been highly extolled but many unfavorable reports of its action have been published. Novocaine is not irritating when injected into the body tissues, it may be resterilized without much effect upon its anæsthetic properties, and it is but feebly toxic. It is valuable for the production of infiltration anæsthesia, but is not so satisfactory when used on mucous membranes, cocaine usually being preferred.

Quinine and urea anæsthesia delays healing of wounds because of the formation by it of a fibrinous exudate in the tissues. Its anæsthetic effects last sometimes for many days.

The use of adrenalin in the proportion of 5 drops of a 1:1000 solution to each 100 ccm. of novocaine solution is sufficient to produce a working anæmia of the most vascular part, causing no pain, no after-hyperæmia, and no interference with wound granulation. It should not be used in tissues where the circulation is disturbed as it may cause necrosis and in plastic work it may interfere with the life of the flaps. Of all local anæsthetics the only ones compatible with adrenalin are cocaine and novocaine. When combined with the holding qualities of adrenalin the ideal solution for local infiltration and conduction anæsthesia is found in novocaine. As much as 900 ccm. of a 0.5 per cent solution and 200 ccm. of a 4 per cent solution have been used in operations.

The symptoms of cocaine or novocaine poisoning are faintness, dizziness, pallor, respiratory disturbances, anxiety, delusions, muscular twitchings, convulsions, and respiratory or cardiac paralysis. There is no direct antidote. The head should be lowered and diffusible respiratory stimulants administered.

Only ill-trained children, nervous persons, and those whose tissues possess but a low grade of nutrition are unsuitable for local anæsthesia. All minor operations, reduction of dislocations, setting of fractures, and abdominal exploratory operations may be done satisfactorily with this anæsthesia. By infiltration anæsthesia is meant the circumferential injection of sound tissues some distance away, from which the tissues within the field of operation are infiltrated in all directions by means of long needles passed in all directions beneath the skin, supplying the deep tissues first. Syringes of 5 and 10 ccm. capacity and needles from 0.25 to 0.125 mm. in length are required. When used frequently novocaine had best be bought in bulk and 250 ccm. of a 4 per cent solution prepared, dissolving the crystals in normal salt solution, then boiling for ten minutes. Weaker solutions may be made by diluting this with normal salt solution. Adrenalin is to be dissolved and sterilized and added in the proportion of 1 mg. to 200 ccm. of a 0.5 per cent solution, 100 ccm. of a 1 per cent solution, 50 ccm. of a 2 per cent solution, and 25 ccm. of a 4 per cent solution.

E. K. Armstrong.

Macht, D. I., Herman, N. B., and Levy, C. S.: A Quantitative Study of the Analgesia Produced by Opium Alkaloids, Individually and in Combination with Each Other, in Normal Man. *J. Pharmacol. & Exp. Therap.*, 1916, viii, 1.

In view of the difference of opinion as to the comparative value of the various opium alkaloids in the production of analgesia, it was thought that a scientific analysis of this property would be of value. Heretofore there had been a lack of a quantitative method for the study of pain and this lack the authors have overcome by utilizing the pain sensation excited by the Faradic current of an induction coil, the apparatus employed being a Baltzer inductorium with a vertical sliding secondary coil which was graduated on one side in centimeters and on the other in Kronecker units.

By experiments the threshold for pain sensation for each point in the body selected as convenient for study was demonstrated. The strength of the stimulus required to produce pain having been determined, a narcotic drug was administered and after its absorption the threshold of pain was again determined at intervals and a rise and fall noted, the strength of the stimuli being compared by noting the relation between the primary and secondary in centimeters or by reading the Kronecker scale.

Small doses of morphine (0.005 mg.) produced no measurable analgesia, while 0.01 mg. produced marked lowering of the pain threshold in two of the three subjects but not in the third, who showed hypersensibility to pain. Nausea was marked after morphine and was even felt after the small doses.

The analgesic power of codeine was slight, being far inferior to that of morphine. No nausea or constipation followed its use. The effects of papaverine in 40-mg. doses were not inferior to those of morphine in 10-mg. doses except that the onset of the anal-

gesia was slower and its duration shorter. The administration of large doses of narcotine was followed by slight dulling of pain sensation, the injection itself causing considerable pain. Narceine and thebaine produced no analgesic effect, rather some hypersensibility. Classifying the alkaloids in the order of their efficiency they can be arranged as follows: morphine, papaverine, codeine, narcotine, narceine, thebaine. Nausea was most marked after morphine, constipation after papaverine and narcotine, and pain from injection after narceine.

The synergism between morphine and narcotine meconate, spoken of as "potentiation," was studied. This morphine-narcotine meconate combination, known as narcophin, 10 mg. of which contain 3 to 4 mg. of morphine, was found to produce nearly as much analgesia as an equal quantity of morphine alone. Even 5 mg. of narcophin, containing less than 2 mg. of morphine and about 3 mg. of narcotine, also produced lowering of the pain threshold, while it was shown that 5 mg. of morphine and 10 mg. of narcotine given alone had no appreciable effect. Narcotine given alone and followed in an hour and a half by a minute dose of morphine illustrated the synergism very distinctly. Less nausea was produced by narcophin than by an equivalent amount of morphine alone, but constipation was more frequent. An interesting observation was that in the subject in whom morphine produced a heightened instead of a lowered pain threshold, this did not occur when narcophin was administered.

Experiments with pantopon or pantopium, a combination of the total alkaloids of opium, 10 mg. of which contained about half its weight of morphine showed that the former possessed greater analgesic powers than half the quantity of morphine alone.

The explanation of the synergism resulting from the combination of morphine and narcotine probably lies in Buergi's hypothesis that combining two drugs belonging to the same chemical series will result in an addition of their chemical effects, while combinations of drugs belonging to different chemical series are prone to potentiate each other. Morphine is a representative of the pyridine-phenanthrene group, narcotine of the benzyl-isoquinoline group.

E. K. Armstrong.

Read, J. S. : Spinal Anæsthesia with Stovaine. *N. Y. M. J.*, 1916, ciii, 114.

In Read's opinion the main objections to the use of stovaine for spinal anæsthesia are:

1. Fear of injury to the spinal cord.
2. Symptoms other than those of analgesia.
3. Uncertainty of anæsthesia and difficulties of technique.

He states that in dozens of punctures he has not yet seen permanent injury to the spinal cord.

By the use of Babcock's solution he has seen no symptoms resulting from the injection except headache or dizziness on standing, persisting for two or three days. He says the most common reason for these symptoms developing is the use of either too old or too cold a solution.

In regard to incomplete anæsthesia the author states that in only one case out of fifty was anæsthesia incomplete. He advises the use of Babcock's solution which is as follows:

Stovaine	0.08
Lactic acid	0.002
Alcohol	0.2
Distilled water	1.8

The needle is introduced slightly to the median line and pushed straight forward. There is a certain "give" when the dura has been punctured. For all urological operations the second or third lumbar interspace is selected.

Read calls attention to the fact that the difference in specific gravity in the solution produces anæsthesia at different levels. In nervous patients he recommends the use of one-sixth of a grain of morphine and one-hundreth of a grain of hyoscine.

In an experience with 50 cases no cardiac or respiratory symptoms have occurred. This series includes four prostatectomies. He believes spinal anæsthesia to be a safer procedure than general anæsthesia.

A. C. Stokes.

SURGERY OF THE HEAD AND NECK

HEAD

Lynch, K. M.: An Amœba in Suppurative and Hyperplastic Osteoperiostitis of Inferior Maxilla. *J. Am. M. Ass.*, 1915, lxv, 2077.

Referring to Flexner's report of an amœba found in artificially obtained pus from an abscess on the floor of the oral cavity, and Doflein's observations of a similar amœba in an abscess with sinuses opening on the right lower jaw, the author gives the history of a case in which his laboratory examination of a resected left half of a mandible disclosed an amœba not commonly found in the mouth, differing somewhat from Doflein's parasite and whose morphology renders questionable its classification as dysenteric.

He is unable to pronounce this amœba the etiologic factor in the lesion, but microscopic examination showed no recognizable bacteria in the pus and animal inoculation gave no results. H. A. Potts.

Bonney, C. W.: Carcinoma of the Jaw. *Am. J. Surg.*, 1916, xxx, 17.

In a five-years' experience in a hospital service where there was an unusually large number of cases of carcinoma of the jaw, the author concludes that early diagnosis of malignant disease of this region is not made as frequently as it is in some other parts

of the body. This situation is rather extraordinary, as in the oral cavity there is an unusual opportunity to observe these conditions at their very inception. Diagnosis is much simplified when it is remembered that these neoplasms are situated on the epithelial surfaces and that the lesion does not heal kindly after the source of the irritation is removed. If after the application of the simpler remedies, prompt healing does not occur, the lesion is most certainly malignant.

The differential diagnosis between carcinoma of the jaw and syphilis, actinomycosis, epulis, and tuberculosis presents no difficulty. Each condition having its characteristics, a more accurate determination of the actual condition is readily made.

A series of 36 cases is reported, all of which were with one exception in men. In 20 cases the mandible, and in 13 the maxilla, were affected. While in the entire series the results were not extraordinary, there were in the series, 10 cases in which the primary operation was undertaken with very good results. As these were a general run of cases in a hospital, it is expected that in private cases the end-results would be much better.

The operative technique shows the removal *en masse* of all involved structures. Preliminary ligation of the external carotid is practiced and no harmful results have occurred. A careful light ether anæsthesia is the anæsthetic of choice. H. P. KUHN.

Fisher, A. R.: Chloramine in the Treatment of Wounds of the Mouth and Jaws. *Brit. M. J.*, 1916, i, 87.

Fisher, Staff Surgeon British Royal Navy, reports his use of chloramine (chemically toluene sodium sulphochloramide) as a new antiseptic agent for the irrigation and lavage of septic wounds. The history of seven cases of gunshot wounds involving the mouth is given, these wounds being by their nature and location highly septic. A two per cent aqueous solution was employed. According to the character of the wound, hourly irrigation through drainage tubes, or frequent gargling or mouthwashing, with the solution was practiced. He asserts that chloramine is a powerful, penetrative antiseptic, is not neutralized by albuminous discharges so readily as are the simpler chemical antiseptics, and is bland, pleasant, and non-irritant.

In all cases, either the wound was maintained cleanly or suppuration quickly stopped. The tongue and breath were clear and repair was rapid.
H. A. POTTS.

Dolamore, W. H.: Prevention of Deformity Following Fracture or Resection of the Jaw; a Plea for the Use of Splints. *Brit. J. Surg.*, 1916, iii, 526.

Dolamore gives an account of his experience in the treatment of fractures and injuries of the jaw-bone. He divides his cases into two classes: (1) those where the jaw is fractured but no bone is lost; (2) where injury is accompanied by destruction of the bone and soft tissues. The treatment in both cases has this in common: that the portions of the jaw must be kept in their correct positions so that afterward the teeth may articulate properly with their opponents.

A general review is given of all the mandibular splints and the conclusion reached that the metal-cap splint is the best in fractures of the mandible. This splint is made of thin metal, pressed out to conform to the shape of the teeth, from a cast taken with the fragments of the jaw-bone in good position. This cast is then cemented to the teeth. Two lateral processes project from the mouth, curving down to the sides of the jaw. These may be joined by a bandage passing underneath the chin. In simple fractures of the jaw-bone, or where there has been lack of bone, this splint meets the requirements best, in that it keeps the fragments in position, allows the patient to eat, and is easier kept clean than any other splint so far devised. In case the patient is without teeth in the lower jaw, wire attachments are soldered to the splint, which rests at the back portion on the gum. This lower splint fits into a vulcanite plate made from a plate of the upper jaw. Various devices are detailed which meet the requirements of the injuries sustained as the result of gunshot wounds, when bone and bits of tissue are lacking.

Special stress is laid on the importance of artificial means of support being used immediately after operation, or injury, to fill out the defect by a mechanical appliance so that the normal contour of the features may be preserved, and secondary cicatricial contraction avoided.

After several months the tendency to scar-tissue contraction lessens, so that is it of material benefit to the surgeon in estimating the size of the flaps at a second operation to correct the cosmetic appearance.
H. G. SLOAN.

Taylor, J. H.: Consideration of a Basal Fracture of the Skull. *Internat. J. Surg.*, 1916, xxviii, 414.

The author urges a decompression operation in all doubtful cases of head injury, for the reason that the signs of increased pressure from hæmorrhages oftentimes do not occur until late. He cites a case in point. HENRY J. VAN DEN BERG.

Davis, E. D.: Fractured Skull with Healed Attic Suppuration of an Unusual Type. *Proc. Roy. Soc. Med.*, 1915, ix, *Otol. Sect.*, 4.

The patient, an engineer, aged 42, complained of deafness after a crushing injury to the head in which the vertex of the skull was fractured and an operation for depressed fracture was performed. At the time of the accident there was hæmorrhage from both ears. The left ear showed extensive and healed attic suppuration, revealing a cavity of considerable size above and behind the tympanum. The deafness was of the middle-ear type and there was no history of deafness or of ear disease prior to the accident. OTTO M. ROTT.

Besley, F. A.: A Contribution to the Subject of Skull Fractures; Analysis of 1,000 Cases at the Cook County Hospital and a Report of 74 Cases Examined at Necropsy. *J. Am. M. Ass.*, 1916, lxvi, 345.

A careful study of seventy-four cases of fracture of the skull at necropsy has convinced the author that the fractures of the base are not produced by a bursting force, but are due to a direct inbending force applied through the articulation of the condyles and atlas. It has been observed repeatedly that the fractures occupy the same position and are of about the same extent, regardless of location of the injury on the vault. The thinness of the skull through the middle fossa accounts for the frequent fracture at these sites. In all the examinations, a fracture of the posterior or occipital fossa that was not a direct continuation of a fracture of the vault was not observed. There were 27 such cases in the series of 74.

A fracture of the inbending type produces more extensive separation of the inner table, which fact can be illustrated by the break on the convex surface of a green stick. When the cranial fracture is produced by a high-powered bullet at a close range, a hydrodynamic force enters in, resulting in a sudden expansion of the brain tissue. When a modern jacket bullet is fired at close range, a complete shattering of the cranial structures may occur. If a skull be fractured by a bullet, it is possible to distinguish between the wound of entrance and the wound of exit. The table which is last penetrated by the missile shows the greater amount of radiating fracture.

In compound fractures of the base, little can be accomplished in the way of prevention of infection. In compound fractures of the vault, infection can be combated to a material extent.

These 1,000 cases show that 384 patients received their injury by falling from a height and 311 were struck on the head; 38 cases were due to gunshots; the cause of injury of 267 cases was not recorded.

The age of the patients varied within wide limits, the youngest being 3 hours old and the oldest 81 years. A large majority (68.7 per cent) were between the ages of 30 and 55.

Blood and spinal fluid from the ears occurred in 316 cases, bleeding from the right ear in 131, from the left ear in 146, and not stated in 18. Free bleeding from the orbital cavity occurred in 10 cases. Unmixed cerebrospinal fluid from the ears occurred in 2 per cent, or in 21 cases. It came from both ears in 3 cases, from the left in 13 cases, and from the right in 5 cases. Free bleeding occurred from the mouth and nose in 172 cases, from the nose in 118 cases and from the mouth alone in 53 cases, or a total of 343. In the fatal cases of all types the respiration average was consistently higher.

The patellar reflexes were increased in 67 cases, absent in 50 cases, with no change recorded in the others.

A Babinski reflex was observed in 55 cases and a Kernig sign in 8 cases. General convulsions were noted in 32 cases. Clonic convulsions of the arm occurred in 6 cases, of the leg in 2 cases, and of the face in 7 cases.

Rigidity of the legs was observed in 29 cases and of the neck in 29 cases. Complete muscular paralysis was observed in the muscles of the face in 47 cases, in the muscles of the legs in 55 cases, and in the muscles of the arms in 58 cases.

In the series of 1,000 cases, vomiting was a common symptom and occurred in 361, or 36 per cent of all cases. In 11 cases the vomitus was almost wholly blood. EDWARD L. CORNELL.

Chapman, V. A.: Osteoma of the Frontal Sinus. *J. Mich. St. M. Soc.*, 1916, xiv, 18.

The author reports a case with operation, the patient having no recurrence after six years. The tumor, of ivory consistence, measured 59 mm. x 40 mm. x 30 mm., and weighed a little less than two ounces. The tumor nested in the right frontal sinus and extended to nearly one inch past the middle line. There was a small perforation in the anterior long wall. All of the anterior table of skull over the cavity occupied by the tumor was removed and the soft parts replaced against the posterior table to prevent any retention pocket. OTTO M. ROTT.

Zange: Translabyrinthine Operation for Tumors of the Acoustic Nerve and the Pontocerebellar Angle (Translabyrinthaere Operationen von Acusticus—und Kleinhirnbrueckenwinkeltumoren). *Berl. klin. Wchnschr.*, 1915, lii, 1334.

Tumors of the pontocerebellar angle and those of the acoustic nerve itself in this region have hitherto been operated upon exclusively by Krause's method. The first stage of this operation consists in cutting a flap of bone over the half of the cerebellum involved, and the second of incision of the dura of the cerebellum, avoiding the sinus and tentorium, laying bare the cerebellum. It is very dangerous and has a mortality of 70 to 80 per cent. The danger lies in the sudden removal of pressure in the posterior fossa when the bone flap is laid back, and in contusions and circulatory disturbances when the cerebellum is moved aside to get at the acoustic and the pontocerebellar angle. These frequently result in death from shock, and paralysis of heart and respiration which may occur during the operation or within forty-eight hours after it. There is also danger of serious hæmorrhage. Improvements in diagnostic methods in recent years have enabled the operator to distinguish between tumors of the acoustic and those of the pontocerebellar angle not involving the acoustic. In the tumors of the acoustic a less dangerous method of operation has been devised than Krause's. This was first proposed by Panse in 1904 but has only recently been used.

In the translabyrinthine operation the petrous portion of the temporal bone, including the apex is chiseled away, even around the carotid, and by

pushing aside the temporal lobe, which is thus laid bare, free access is given to the acoustic nerve and the pontocerebellar angle. The decrease in pressure of the posterior fossa takes place gradually, and the whole operation is extradural. Therefore there is no danger of secondary infection, and there is no necessity for displacing or pulling upon the cerebellum. The operation has been performed four times on extradural tumors of the acoustic, in 1912 one case each by Quix and Kuemmell and in 1915 two cases by Schmiegelow. But it can be performed even when the tumor extends inside the dura into the pontocerebellar angle, even when it is as large as a hen's egg, as is shown by the case demonstrated by the author in which a neuroblastoma as large as a hen's egg was successfully removed after the whole of the petrous portion had been chiseled away. The translabyrinthine method is to be preferred in all cases of true acoustic tumors.

In the discussion WREDE held that the advisability of the translabyrinthine operation depended on the size of the tumor, and this could not be determined in advance. Moreover it destroys the hearing, which may return after the Krause operation.

Stock said that all the cases he had operated upon by Krause's method had died.

Zange replied that the size of the tumor could be determined clinically. In true acoustic tumors the hearing is destroyed anyway. In cases where the hearing is only affected by pressure of a tumor not involving the acoustic itself the Krause operation is indicated. A. GOSS.

Schloss, O. M., and Schroeder, L. C.: Nature and Quantitative Determination of the Reducing Substance in Normal and Pathologic Cerebrospinal Fluid. *Am. J. Dis. Child.*, 1916, xi, 1.

The reducing substance in cerebrospinal fluid is a fermentable, dextrorotatory sugar, probably dextrose.

In infants and children free from meningeal disease, the cerebrospinal fluid sugar ranges from 0.05 to 0.134 per cent (dextrose), approximately the same figures which obtained for blood sugar.

There is no decrease in the reducing power of the cerebrospinal fluid in meningism.

A large proportion of the cases of tuberculous meningitis show a decrease in the sugar content of the cerebrospinal fluid at some stage of the disease. In a few cases, however, the sugar is normal at all times or diminished but slightly. A decrease only is of diagnostic value. EDWARD L. CORNELL.

Watanabe, W. K., and Crawford, A. C.: Does the Pituitary Gland Contain Epinephrin or a Compound Similar to It? *J. Pharmacol. & Exp. Therap.*, 1916, viii, 75.

As epinephrin is the most active pressor substance known to occur in the animal organism, it would be logical to infer that pituitary extracts owe their blood-pressure raising effect to an action on the suprarenal glands or that epinephrin itself, or a similar compound, occurs in the pituitary gland. However, occlusion of the suprarenal circulation does not diminish the pressor effect of pituitary extracts, and arguments indicating the absence of epinephrin in pituitary extracts only hold good providing such extracts represent a single pure compound. But it has been shown that in pituitary extracts there must be one or two depressor compounds and one or more pressor compounds along with colloids. Watanabe and Crawford are convinced that epinephrin, or a similar compound, is responsible for much of the pressor action of the pituitary, modified by the presence of one or more active compounds along with colloids. Epinephrin has not yet been isolated from these glands and this may be due to the small amount present.

The experimental work conducted by these observers may be summarized as follows:

1. Pituitary extracts prepared by certain methods give color reactions similar to those given by suprarenal extracts.

2. Slowing of the heart-rate in the dog was seen to result from the use of a preparation in which no pressor action was detected.

3. Pituitary extracts cause a strong contraction of non-pregnant cats' uteri, and this is not changed by the addition of certain amounts of epinephrin.

4. After ergotoxin injection, pituitary extract causes a lowering of blood-pressure as by epinephrin, suggesting that some of the pituitary action is on the sympathetic nerve terminals.

5. Isolated loops of rabbits' and cats' intestines are strongly contracted by pituitary extract and are not relaxed by the addition of certain amounts of epinephrin to such extracts.

6. By oxidation with MnO_2, pituitary extracts lose their pressor action and some of their color reactions, but retain to some extent their action for both non-pregnant cats' uteri and intestines.

7. Several methods for isolation of epinephrin were tried on the pituitary glands, but unsuccessfully, possibly because of the small amounts present.

E. K. ARMSTRONG.

NECK

Coley, W. B.: Primary Neoplasms of the Lymphatic Glands Including Hodgkin's Disease. *Ann. Surg.*, Phila., 1916, lxiii, 35.

The author attempts in this paper to add some further clinical data bearing upon primary tumors of the lymphatic glands, on the basis of a study of 167 cases which he has personally observed. He is impressed by the fact that it is difficult, or many times impossible, to make a correct diagnosis by clinical means and that it is very often necessary to remove a gland for diagnostic purposes before treatment is undertaken.

Coley believes that there is much evidence pointing to very close relationship between the group of tumors at present designated as malignant tumors — sarcoma and carcinoma — and the group re-

garded as Hodgkin's disease. He believes that the best results may be expected by the proper use of the toxins, either alone or in conjunction with the X-rays or radium. GEORGE E. BEILBY.

Freeman, J. K.: Hyperthyroidosis Associated with Gynecomastia. *Therap. Gaz.*, 1916, xl, 9.

So far as the author has been able to ascertain, the condition of gynecomastia associated with hyperthyroidosis has never before been reported. His case was a man, 37 years old, married, father of four children. A sister aged 30 has goiter, and a daughter developed enlargement of the gland at 15. The complaints for which the patient sought relief when first seen were nervousness and general weakness which were so pronounced that he could not attend to his work of harness making. The findings were those of a typical case of hyperthyroidism, and the patient responded favorably to the proper medical handling of the case. Three months after the onset of nervous symptoms, a distinct enlargement of both mammæ was noted with the formation of large, pigmented areolæ. The author does not state definitely when the hypertrophy of the mammæ occurred. A brief review of recent literature on hyperthyroidism and a rather extensive review of the literature upon gynecomastia are given.

E. FISCHEL.

Marine, D., and Feiss, H. O.: The Absorption of Potassium Iodide by Perfused Thyroid Glands and Some of the Factors Modifying It. *J. Pharmacol. & Exp. Therap.*, 1916, vii, 557.

In this study the authors attempt to answer the question as to whether or not the surviving thyroid cells *in vitro* have a specific affinity for iodine. They chose the method of perfusion because of its simplicity and because similar operations can be carried out *in vivo*. In all of these experiments the thyroids, kidneys, and spleens of dogs were used, because the goitrous thyroids of dogs, the authors believe, are the most easily perfused of all organs under conditions at all physiological. The method of perfusion was primarily utilized to ascertain whether salts of iodine were held in the surviving gland in quantities far greater than in other surviving tissues similarly treated, and if this was true, whether one could not partially involute actively hyperplastic glands *in vitro*, as invariably happens *in vivo*—the changes in the living animal's thyroid being recognizable in from 36 to 48 hours. The authors demonstrated the former, but the latter involved the grave difficulties of maintaining nutrition and of getting rid of products of metabolism. The technical and aseptic problems were readily overcome. They believe that eventually it will be possible to partially involute an actively hyperplastic gland by some such method.

The question of the absorption of other salts than iodine, as for example bromides, arsenic, etc., has not been investigated. It is known that following the administration of bromides the thyroid retains a part temporarily, but it produces none of the effects or activities of iodine.

The authors' experiments indicate that the elaboration of iodothyreoglobulin is a slow and probably complex process, and it is hoped that further study will lead to a definite conception of the minimum interval of time required for its production. Such knowledge for the iodine protein combination might be applicable to other protein compounds within organic substances whose chemical nature and function are little understood.

The authors summarize the results of their experiments as follows:

1. Artificially perfused thyroids take up and retain potassium iodide to the same extent that *in vivo* perfused thyroids do.

2. This characteristic is not shared by the liver, kidney, spleen, or muscle.

3. The amount of potassium iodide retained is independent of its concentration in the perfusion fluid.

4. Only surviving glands exhibit the ability of taking up potassium iodide.

5. Potassium cyanide inhibits this activity of the thyroid.

6. It is possible to wash out with defibrinated blood a very small amount of the iodothyreoglobulin in an hour's perfusion even in intact glands rich in iodothyreoglobulin.

7. Autolyzing glands do not take up potassium iodide and rapidly give up their stored iodine to the perfusate.

8. The potassium iodide stored in a thyroid gland form one hour's perfusion, whether *in vivo* or *in vitro*, is pharmacologically inactive. GEORGE E. BEILBY.

Wilson, L. B., and Kendall, E. C.: The Relationship of the Pathological Histology and the Iodine Compounds of the Human Thyroid. *Am. J. M. Sc.*, 1916, cli, 79.

The data herein presented furnishes additional proof of the statements previously made by Wilson that the symptom-complex which is generally recognized as typical Graves' disease, exophthalmic goiter, is constantly parallel in all its stages of development and regression with similar stages of development and regression in the parenchyma of the thyroid. This parallelism is shown in the average duration of goiter, the average duration of toxic symptoms, and in the progressive and regressive histological changes. Now, for the first time in detail the percentages and total amounts of iodine, the pathological groups, and the clinical types have been compared in the same series of cases.

The authors have shown that iodine in the glands exists in two independent forms of combination, only one of which is toxic. One fact running through all the tables is that the amount of iodine in the gland parallels the clinical grouping. In the actively hyperplastic glands it has been shown that the amounts of iodine and φ-iodine are very low, but in cases where regression has occurred the amounts of

iodine are high. In contrast to this it was found that the amount of iodine in the non-hyperplastic toxic glands is higher than in the non-hyperplastic atoxic glands. GEORGE E. BEILBY.

Pool, E. H., and Falk, H. C.: Concerning the Surgical Anatomy of the Thyroid with Special Reference to the Parathyroid Glands. *Ann. Surg.*, Phila., 1916, lxiii, 71.

This paper deals with certain essential anatomical details which have direct bearing upon the operation of excision of the lateral lobe of the thyroid gland, particularly the relationship of the surgical capsule, the parathyroid glands, and the recurrent laryngeal nerve to the posterior part of the lobe. The authors have endeavored particularly to determine whether the theoretical advantages of leaving a portion of the posterior part of the lobe, that is, the part in relation with the recurrent laryngeal nerve and the parathyroid bodies, have sufficient anatomical basis to outweigh the practical disadvantages of the procedure. With this object in view an effort has been made to trace the course and to establish the relations of the surgical capsule in the posterior region of the lobe and to determine the relationship of the parathyroids and the recurrent laryngeal nerve to this fascia and to the thyroid itself. The authors are led to make the following deductions:

Since two parathyroids usually lie on each side, and inasmuch as two parathyroids apparently can satisfy the demands of the body, the chance that tetany will develop as a result of extirpation of one lobe is extremely remote. It is reasonably safe, therefore, as far as tetany is concerned, to perform complete intracapsular extirpation of one lobe, as is so often done, for instance, in exophthalmic goiter.

In regard to safeguarding the recurrent nerve it may be emphasized again that in a true intracapsular extirpation of a lobe the recurrent nerve is relatively immune from injury. Nevertheless as has been explained the capsule may be torn at its posterior part and the cellular plane which contains the recurrent may be entered and the nerve injured. This danger is avoided by leaving a portion of the posterior part of the lobe.

It is advantageous, but not imperative, to leave *in situ* the posterior parts of both lateral lobes in relation with each of which a recurrent laryngeal nerve and two parathyroids usually lie. Complete bilateral extirpation, the isthmus only being left, should never be considered. The posterior part of one lobe must always be left. GEORGE E. BEILBY.

Freeman, L.: Further Experience with the Use of the Wire Tourniquet in Partial Thyroidectomy. *Am. J. Surg.*, 1916, xxx, 8.

Freeman describes a method for the temporary control of hæmorrhage during operations upon the thyroid. This consists in applying on either side of the lobe to be removed, after it is delivered from the wound, two stiff pieces of wire which are bound together with strong cord. After the removal of such a portion of the gland as is necessary and suturing is completed, the wires are removed.

The advantages claimed for this method are:

1. It is easily and rapidly applied, requiring no particular skill in its adjustment and saving considerable time.

2. It effectually controls all hæmorrhage, thus obviating the necessity for crowding the field with hæmostatic forceps.

3. It does away with danger to either the recurrent laryngeal nerves or the parathyroid bodies, because it is applied at a safe distance from them, and even if they should by any chance be caught, the pressure is not great enough to permanently injure them.

4. It compresses the goiter without crushing it, which is of importance in Graves' disease at least.

5. Because the loops pass through the tissue the wires are prevented from slipping during the course of the resection irrespective of the size of the remaining stump. GEORGE E. BEILBY.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Martin, G. F.: Some Phases of the Surgery of the Chest Cavity. *N. Eng. M. Gaz.*, 1916, li, 27.

Pleural effusion usually clears up promptly after aspiration, but if pus is present, free drainage is indicated. In draining an empyema the tubes must be placed in the most dependent position and should be securely fastened lest they slip into the pleural cavity. The majority of cases recover under this treatment, but when they fail to close the problem becomes much more difficult. The pleura becomes thick and unyielding, its two surfaces remaining separated and a permanent pus-secreting cavity results. The two measures of greatest value in overcoming this condition are the Estlander operation and decortication of the lung. The objections to the former are the great deformity of the chest wall and the spinal column. Decortication aims to restore the parts to a normal condition.

Decortication, by removing the abnormal thickened lung covering, allows the collapsed lung to expand. In the first case operated upon by the author an Estlander operation was done for the relief of an old-standing empyema cavity, but without permanent benefit. The chest was again opened, the lung found rolled up in a ball at the apex of the cavity and the pleura was more than an inch in thickness. The adhesions of the latter to the vertebral column and ribs were divided one by

one and the lung allowed to expand until it almost filled the whole cavity. This was accompanied by severe hæmorrhage and shock, but recovery was complete and was accompanied by very considerable regeneration of the ribs over the field of operation, as the periosteum was not removed. A second case also made a complete recovery. Neither were operated upon under differential pressure. The room temperature must not be below 80° in work of this kind. E. K. ARMSTRONG.

Pryor, J. H.: Some Puzzling Features of Empyema. *N. Y. M. J.*, 1916, ciii, 10.

The symptomatology of empyema in the child may be quite misleading at times. The sudden onset and the appearance of symptoms similar to those manifested in pneumonia must be borne in mind. Physical signs in children are frequently remarkably modified in comparison with those found in the same condition in the adult.

The author had five cases of empyema associated with subdiaphragmatic abscess. The subdiaphragmatic abscess was usually neglected and only opened up later when the symptoms were not relieved by drainage of the pleural cavity. In all of these cases there was tenderness over the upper half of the abdomen with muscular rigidity and resistance to pressure. Pain could be caused by pushing up against the diaphragm.

Hiccough makes one suspicious of this condition. The diagnosis may be made by noting the difference as seen in pleural effusion, where there is a change of percussion sound during deep inspiration after altering the position of the child, by observing the absence of percussion sound modified by position. The breath sounds and conduction of sounds through a large accumulation of fluid may be most deceptive when considered alone.

Pryor draws the following conclusions deducted from these cases:

1. Exclude other conditions, particularly pneumonia.
2. Remember the possibility of associated pneumonia.
3. Always compare the two sides of the chest.
4. Always make use of the change of position and mark the altered levels of the fluid.

Aspiration with a needle is the best check in cases of suspected empyema. It is well to see that the needles are quite sharp and to have the child's body bent away from the operator with his arm on that side thrown up over his head in order to increase the space between the ribs, so that the needle will not come in contact with them when the puncture is made. Children usually complain of the needle puncture in using novocaine as much as they do when the puncture is made without any preliminary blocking. In case the puncture is made high, the character of the exudate may be misjudged. Seropurulent fluid may be found in the upper chest while the exudate is quite thick and cheesy below.

If the rib resection is made too high in the chest, an encapsuled mass may remain at the place where the diaphragm is reflected from the chest wall.

Symptoms of profound toxæmia, such as rapid breathing, high fever, and disturbed heart action are often due to the association of a pericarditis. Death in these cases is usually caused by septic endocarditis, alone or combined with pericarditis. The prognosis is grave in this type of cases.

During childhood the drainage tube can be dispensed with quicker than in the case of the adult. It is wise to begin deep-breathing exercises early in order to have the lung become entirely normal again.

Recurring empyema and undetected pockets of pus are very trying. The fluoroscopic screen is of the greatest help in their detection.

As in the child, the diagnosis of empyema in the adult must be made early and prompt relief given if a comparatively good result is expected, otherwise the patient will be left with a partially disabled lung for the remainder of his life.

The author thinks that the rapid breathing in most cases is referable to toxæmia and the involvement of the pericardium or diaphragm rather than to the size of the effusion. Encapsulated abscesses between the lobules of the lung are most readily diagnosed by the aid of the puncture needle with the fluoroscopic screen. In case the X-ray is not available, dependence will have to be placed on fine changes in breath sounds and pitch of the tone. Cough must be employed to bring out adventitious sounds.

There are detailed several cases of recurrent empyemas and the individual discussion of the cases is taken up. From these the author derives the following conclusions:

1. Vastly thickened adhesions causing the obscuration or absence of physical signs, make the diagnosis difficult. In shaking the patient when under observation by means of the fluoroscopic screen fluid waves may be detected in the pus of the abscess. There is great danger of pleural hæmorrhage from the thickened adhesions in operating on such cases. In case hæmorrhage is encountered it is wise to compress the chest with a rubber bandage.
2. Resection of one or more ribs may be of material help in exploring as well as giving free drainage. The greatest number of these pockets of pus are located in the lower half of the chest. The same trouble from subdiaphragmatic abscess is encountered in the adult as in the child. Drainage tubes in contact with the diaphragm often cause much pain to the patient.
3. Attention is drawn to the fact that infarcts of the lung not infrequently follow surgical operations of the upper right abdominal quadrant. These may lead to lung abscesses.

The author believes that tuberculous empyema where there is no secondary infection ought to be aspirated only. When a rib is taken out in these cases the cavity very rarely closes. He quotes

A. H. Garvin's treatment which consists of washing out through two needles with large amounts of saline, and thinks the results are much better than in resecting the rib.

By early diagnosis carnification and atelectasis may be avoided as a result of early interference. In case the effusion is not evacuated the lung may not only fail to expand fully, but the diaphragm on that side is also flattened and tends to lose its power of contraction, probably through the neuromuscular mechanism, rather than the varying pressure conditions it is exposed to. H. G. Sloan.

Gerdine, L.: Parapneumonic Empyema. *Am. J. Dis. Child.*, 1916, xi, 33.

In a series of 15 cases of typical lobarpneumonia or bronchopneumonia in children under four years of age, seen in the Children's Memorial Hospital, exploratory punctures of the chest were made as early as possible in the course of the disease. The needle was put in over the area of greatest impairment as shown by physical signs and roentgenograms. In only one of the cases where fluid was not found at the first puncture were subsequent trials made, and no fluid was found until the twenty-second day, when a typical metapneumonic empyema was found.

In 6 of these 15 cases (40 per cent) fluid was recovered by puncture before the seventh day of the disease, always before the crisis. Five of the six fluids were opaque and yielded a large clot. They contained a large number of cells, between 70 and 80 per cent polymorphonuclear leucocytes. No micro-organisms could be demonstrated in them by smears. Cultures on agar, milk, bouillon, and some on blood-agar, gave no growths. Inoculations into mice produced no harmful results, except in one case in which the mouse died within twenty-four hours, but no lesions were found and no organisms could be grown from its heart's blood or serous cavities. In all 5 cases the fluids were absorbed spontaneously, as was shown by later punctures and roentgenograms. The clinical course of the disease was never noticeably affected by the presence of these fluids.

Although the literature on this subject seems large, the actual number of cases with sufficient description of the fluid found is too small for very definite deductions. However, the author puts forward tentatively the following conclusions:

1. Fluid is present in the pleural cavity in a large number of cases of pneumonia before the crisis and can be demonstrated, sometimes by physical signs, sometimes by roentgen ray, and sometimes by puncture, even when other physical signs are not apparent.

2. The clinical course of the pneumonia may not be altered by this complication.

3. In the majority of cases the fluid is serofibrinous in character, though perhaps containing a large cellular element, polymorphonuclear in type. These fluids are sterile as a rule.

4. True pus is present much more rarely and may contain organisms of more or less virulence. The frequency of the presence of organisms in these cases cannot be decided on the data as yet secured.

5. The virulence of the isolated organisms determined by animal inoculation seems to be of value in prognosis.

6. Only in cases with serofibrinous and purulent fluids containing organisms of a high grade of virulence should surgical interference be considered.

Edward L. Cornell.

HEART AND VASCULAR SYSTEM

Yates, W. N.: Injury with Extravasation of Blood in the Pericardium. *J. Mo. St. M. Ass.*, 1916, xiii, 29.

A farmer, aged 46, was thrown from his wagon and sustained several cuts and bruises about the body, but the most serious injury was to the left chest wall. The fourth and fifth ribs on the left side near the anterior axillary line were fractured. There was a bulging of the chest wall just outside the sternum and a corresponding depression of the chest wall in the axillary region. There were pronounced shock and intense pain in the left side of the chest, greatly intensified at every attempt at movement.

During the following night there had developed with each cardiac impulse a well-pronounced splashing or succussion sound. It was synchronous with the systole and loudest just above the apex beat. This sound was loud enough to be distinctly audible all over the room. It was interpreted to signify that there had been a puncture of both lung tissue and the pericardial sac by the end of a broken rib, resulting in an effusion of both blood and air in the pericardium. The patient's condition was grave for some ten days or two weeks, his temperature ranging from 100 to 103° F., pulse 110 to 125 or 130, accompained by much suffering, dyspnœa, and marked sweating. The abnormal sound persisted for two weeks. The dyspnœa and other untoward symptoms slowly subsided and at the end of three weeks his pulse and temperature were normal and he was able to be up and about the ward.

Edward L. Cornell.

PHARYNX AND ŒSOPHAGUS

Moorehead, R. L.: Post-typhoid Ulceration and Stricture of the Œsophagus. *Laryngoscope*, 1915, xxv, 848.

The author reviews the cases reported in the literature and adds a report of his own cases.

Of the 17 cases of post-typhoid stricture on record, 2 occurred in females, the remainder being in males under 36 years of age. The time of the development of the difficulty in swallowing varied from the second to the twelfth week after the onset of the fever. but was most often noted about the

fourth week. Only two of the cases showed any stricture formation in the upper part of the œsophagus, and in both of these cases strictures were also found in the lower end.

Factors favoring the formation of ulcers are: (1) a low grade inflammation from which the whole of the digestive tract suffers, and (2) the local stasis of blood which is increased by gravity. The majority of the cases had noticed difficulty in swallowing during convalescence from typhoid or even later. Hæmatemesis and pain in the epigastrium were not noted, but these as well as dysphagia have been noted where no ulceration of the œsophagus existed; consequently there are no classical symptoms by which this condition can be diagnosed.

In the series reviewed, gastrostomy was performed upon 6 cases with one death; 8 were dilated with bougies with one death; and 3 died, apparently without either operation or dilatation. These cases all occurred before the perfection of œsophagy, and the author points out that at the present time the mortality should be practically nil, and if the patients are seen before severe starvation develops gastrostomy will be unnecessary. OTTO M. ROTT.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Reder, F.: Technique for Making the Suprapubic "Stab Wound." *J. Am. M. Ass.*, 1916, lxvi, 272.

In using that efficient method of draining the abdominal cavity, the suprapubic "stab wound," care must be taken to avoid injury to the underlying organs or to the directing finger and peeling-off of the parietal peritoneum at the point where the knife is to penetrate. To obviate these dangers it is advised that a ball-forceps, made by fusing a ball of soft metal on the end of a 12-inch pedicle forceps be used. The ball should be the size of a marble and divided so that the forceps may be opened. It is introduced through the abdominal wound and pressed against the abdominal wall. An incision is made down to it; it is then pressed into the wound and opened sufficiently so that a drainage tube may be grasped and drawn into the abdominal cavity. E. K. ARMSTRONG.

Gatewood: A Strangulated Epigastric Hernia. *J. Am. M. Ass.*, 1916, lxvi, 85.

The frequency of hernias occurring in the linea alba between the ensiform cartilage and the umbilicus varies when compared with the frequency of other hernias from 0.19 per cent to 1.37 per cent, according to the statistician. Of the various types usually described the least common is that which contains omentum and intestine. Strangulation of epigastric hernias is exceptionally rare, only 12 cases having been thus far reported, and of these only 5 contained omentum and bowel. To these Gatewood adds one case as follows:

This hernia, which was diagnosed prior to operation, occurred in a man who had been injured some years before by a wagon passing over him. The strangulation had occurred three days prior to his admission to the hospital. Immediate operation was performed under local (novocaine) anæsthesia, and four inches of small bowel together with some adherent omentum found. Closure was made by imbrication of the abdominal wall from above downward (Mayo method), and the patient made a complete recovery. GATEWOOD.

Balfour, D. C.: Non-strangulated Diaphragmatic Hernia Due to Indirect Injury. *Ann. Surg.*, Phila., 1916, lxiii, 78.

Diaphragmatic hernia is a condition sufficiently rare to justify the report of all cases and especially those successfully operated upon. Balfour's case is especially interesting because of the history and the operative procedure undertaken for the cure of the condition. The patient was a railroad conductor 47 years of age who, four years previous to examination, had sustained a very violent crushing injury from falling logs. From the time of the accident he had had unabated burning and pain at times increasing to a colic which began in the epigastrium and radiated into the left chest. There was marked dyspnœa after the accident and he could not lie down in bed. He was frequently aware of rumbling and gurgling in the left chest. Catharsis was always necessary to move the bowels. Physical examination showed the heart in the midline; under forced respiration splashing sounds of fluid and air were heard in the left thorax as high as the nipple and to the left of the apex. Other signs were strongly suggestive of fluid and air in the left pleural sac. The roentgenogram showed the stomach high in the left thorax, distorted, and slightly rotated. The colon occupied the upper part of the left thoracic cavity, the splenic flexure being above the sternoclavicular junction. In discussing differential diagnosis, the author states that the most important evidences of hernia are: (1) destruction of the definite dome shape of the diaphragm; (2) the appearance of lung tissue through the gas bubble in the left chest; (3) the demonstration of bismuth in the colon above the level of the bowline in the chest.

Operation was performed under intratracheal ether anæsthesia with the patient in a moderate reversed Trendelenburg position. The incision was along the outer border of the left rectus muscle to the rib margin and from there along the margin towards the midline. Several feet of jejunum, the stomach, the colon, and the spleen were in the thoracic cavity and were with great difficulty brought down into the abdomen since each inspiration drew them up into the thorax. The hernial opening

was seen to occupy about the center of the left dome of the diaphragm, its greatest diameter was anteroposterior and its average seven inches. The edges were thickened and rounded and were not "freshened" for closing. After the application of coaptation forceps, the opening was closed in the anteroposterior direction for two-thirds of the distance; then the most distant edge of the opening was picked up and the closure was completed in a direction at right angles to the beginning. Number 2 catgut continuous suture reinforced by interrupted silk was used in the closure, and was satisfactory in every way.

There was a subacute intestinal obstruction three weeks after the operation due to an adherent loop of intestine to the line of incision, but after this was relieved the patient made a perfect recovery with all the abdominal organs in proper place as shown by roentgen examination before the patient left the hospital.

An interesting feature of the operative findings was the finding of two ulcers, one on the lesser curvature of the stomach, the other on its posterior wall, both of which the author suggests were possibly due to the abnormal position of the stomach in the thorax.

In a short discussion as to the relative merits of the transthoracic, abdominal, and combined abdominal-thoracic routes the author believes that the possibility of complicating lesions to abdominal viscera makes the abdominal route the one of preference. E. FISCHEL.

GASTRO-INTESTINAL TRACT

Boehler: Hopeless Prognosis of Gastro-Intestinal Wounds Without Operation (Die Prognose der Magendarmschuesse ist ohne Operation absolut schlect). *Med. Klin.*, Berl., 1915, xi, 1232.

Boehler was a believer in the conservative treatment of abdominal injuries at the beginning of the war, but after having treated over 300 penetrating wounds of the abdomen he is convinced that cases in which the stomach or intestine is injured practically never recover without operation. The favorable statistics from conservative treatment result from the fact that all sorts of abdominal injuries are classified together, while in a considerable percentage of them the intestinal tract has not been injured. Such wounds recover quite readily under conservative treatment. It is quite possible for bullets to pass between the loops of intestine without injuring them. It is not always possible to make a differential diagnosis between intestinal injury and internal hæmorrhage, but both demand laparotomy.

Cases of intestinal injury should have a compression bandage put on and should be transported as rapidly as possible to the nearest hospital for operation. Operation should be performed within the first ten hours if possible. Small openings may be sutured, but if they are large or there are numerous wounds in the intestine or if the mesentery is torn resection should be performed. When performed in time operation on intestinal injuries is perhaps the most hopeful field in military surgery, for the patients are completely normal after the operation, while in head surgery, for example, there are very apt to be mental or psychic defects following the operation. A. GOSS.

McGlannan, A.: Linitis Plastica Hypertrophica (Leather Bottle Stomach); Report of a Case. *J. Am. M. Ass.*, 1916, lxvi, 92.

The author discusses the condition and reports the following case:

The patient, a white woman, aged 22, had a previous history of typhoid fever ten years ago. The onset of the present illness was abrupt, twenty days previous. The initial symptom was vomiting, which continued daily, with acrid eructations occurring almost constantly. There were slight pain in the abdomen and marked constipation. There was a progressive loss of weight.

The patient was greatly emaciated, the abdomen scaphoid. There were no masses or tender points. The liver was not enlarged. The thoracic viscera were normal.

Analysis of stomach contents showed a total acidity of 10, with absence of hydrochloric and lactic acids. Blood examination revealed: red blood cells 3,240,000; hæmoglobin 60; white blood cells 8,000. The Wassermann reaction was negative. Roentgen examination revealed a small vertical stomach, pyloric stenosis, retention, and diminished peristaltic contracture.

A posterior gastro-enterostomy was done. When the abdomen was opened, the stomach was found small and not adherent. The peritoneal surface was a dull grayish purple, the walls rigid and very thick. The pylorus would not admit the little finger. It was impossible to close the gastro-enterostomy clamp in the usual way and, therefore, the one on the stomach was not used. After the usual two posterior rows of linen sutures were in place, the stomach and jejunum were opened. The stomach wall was about 15 mm. thick and each layer stood out distinctly, the muscularis showing especially the glistening fibrous bands. The mucous membrane was thin and friable and the strings of white fibrous tissue running up from the submucosa showed plainly as they ran into the cyanotic mucous membrane and seemed to anchor it to the deeper layers. In contrast, the jejunum was thin walled and the mucous membrane protruded from the incision. A continuous catgut suture united the mucous layers and the two rows of linen sutures were carried around on the front of the anastomosis. The mesocolon was sutured in place and the wound closed in layers.

The patient made an uneventful recovery, taking solid food on the tenth day. She is now in perfect health, two and one-half years after the operation. EDWARD L. CORNELL.

Remsen, C. M.: The Acute Typhoid Abdomen, with Especial Reference to Surgical Complications. *J. Am. M. Ass.*, 1916, lxvi, 28.

Occasional operative reports and more frequent necropsy reports have fairly well demonstrated that the occurrence of acutely inflamed appendices in typhoid fever is more than a coincidence. It is not difficult to imagine the occurrence of the complication when one recognizes the pathology of the primary disease.

It is fair to say that many typhoid patients exhibit increased tenderness in the right lower abdomen. This may be expected when one recalls the usual situation of the lesions, the lower ileum. Hence, tenderness in the right iliac fossa may be only the result of localized patches of peritoneal inflammation due to underlying intestinal ulceration in this region. Fever usually exists, since the occurrence of this complication is to be expected more frequently when the typical lesions are most pronounced. When one inspects the peritoneal surface of the diseased ileum, in the third week, for instance, and sees the localized areas of peritonitis corresponding to the multiple ulcerations, the presence of fibrin and fibropurulent deposits and the purulent free fluid of variable quantity, it is easy to believe that an additional inflammation in an adjacent portion of the intestine may not change the symptomatology materially. It is enough that even the most closely watched patients may sometimes develop a perforation and die without the slightest inkling being given of a change in the abdominal features. In view of this, there are no clinical aids of any value at all which should be dismissed, and yet one often finds that on account of the depleted condition of the patient many of the usual clinical aids will fail in the test.

It is hardly a question in typhoid conditions as to whether a patient has appendicitis or perforation. It is merely a question of whether the patient is in such condition that, one or the other of these being suspected, the presence of either being a potential fatality, exploratory operation should be undertaken.

In a series of 9 cases of typhoid operated upon for suspected perforation, 4 showed acute appendicitis, in one of which there was a large perforation near the tip of the appendix. In passing, it is interesting to note that a fifth patient, who had the usual signs of subacute appendicitis of two days' standing, showed a perfectly normal appendix, but numerous large swollen glands in the lower mesentery — evidently the cause of the tenderness — proved later to be the first demonstrable sign of a subsequent typical attack of typhoid fever.

Of the 5 remaining cases, it is to be observed that in none was there an attempt to distinguish between appendicitis or suspected perforation. Rather the point common to all cases consisted in the signs of increasing peritoneal irritation in the right iliac fossa suggesting peritonitis, appendiceal involvement, peri-intestinal irritation from ulceration, or direct perforation, and the important question for decision was always, "Can we justifiably decide against exploration"; in other words, "Do we know that a fatal lesion does *not* exist?"

Three patients died within the first twelve hours. Each had general peritonitis with quantities of foul smelling purulent fluid and intestinal contents throughout the peritoneal cavity. Little may be expected in cases at this stage. This merely argues for early interference. Two other patients died, one eleven days later from the typhoid fever, after making an excellent operative recovery. Another died on the eighth day, after making a similar recovery, at which time the value of using silver wire as a suture in such cases was not recognized, and on the seventh day the wound parted, allowing the intestines to extrude under a full dressing. Four patients were discharged well after recovering from operation and the typhoid fever.

EDWARD L. CORNELL.

Wallace, C.: Early Treatment of Gunshot Wounds of the Alimentary Canal. *Lancet*, Lond., 1915, clxxxix, 1336.

In trying to arrive at the relative frequency of abdominal wounds the following data were obtained in a certain number of casualty clearing stations:

1. 1.88 per cent of all wounds.
2. 1.5 per cent of all wounds.
3. 0.75 per cent of all wounds.
4. 0.62 per cent of all wounds.

The statistics from 9 field ambulances and 7 casualty clearing stations for a period of six months showed the following results: Percentage of abdominal wounds to total wounds, field ambulances, 1.92 per cent, casualty clearing stations, 0.72 per cent. The difference is attributed to the greater mortality in field ambulances.

In 1,098 abdominal wounds in 9 field ambulances during a period of six months the mortality was 30.33 per cent. In 131 cases of perforating abdominal wounds in the same period from 6 casualty clearing stations the mortality was 58.49 per cent.

As to the influence of position of the wound and direction of the missile on the probable nature of the injury, it is noted that in the region above the pyloric plane are found the least serious among abdominal wounds. Side-to-side wounds, especially if they are located far back, are very serious. Vertical wounds, from above downward, are also serious.

Midline anteroposterior wounds are seldom seen, due to the vena cava and aorta occupying this line, wounding of which causes immediate death. The liver is most apt to be hit on the right side of this line, and the stomach occupies the space on the left side. Stomach wounds usually occupy both surfaces of the organ.

On the right side the liver will be hit; the cardia and greater curvature of the stomach will be perforated on the left side. The kidneys will be perforated by shots traversing the lateral lines of the

body including the spleen and splenic flexure on the left side. Uncomplicated liver and stomach wounds are as favorable as similar wounds in the epigastric region.

Oblique epigastric and hypochondriac wounds are necessarily more serious and they become more so as they become more oblique. The character of the liver wounds in these shots is marked by greater laceration and greater tendency to hæmorrhage, and the stomach wounds are marked by a long slit or double opening when the axis of the flight of the bullet becomes parallel to the anterior wall, in which case extravasation is prone to occur. The liver and stomach wounds are apt to be complicated by spleen, kidney, and splenic flexure involvement.

Vertical epigastric or hypochondriac wounds are nearly all inclined downward and inward, though they may be almost vertical, the entrance and exit wounds being located on the front of the body. In such cases the wounds of the liver and stomach are complicated by involvement of the colon or small intestine. Vertical wounds on the lateral surface appear as thoracic wounds when they show no exit wounds. Those on the right side are not so dangerous since they only traverse liver substance; those on the left are more dangerous as they are apt to implicate the spleen, stomach, or colon. These at first point entirely to thoracic injury.

Posterior and lateral wounds of the hypochondriac region are apt to be single entry wounds. Those from side to side are seldom seen, owing to their great fatality. They involve the liver, spleen, stomach, pancreas, and even the great vessels.

Wounds between the axillary lines often exhibit omentum protruded through the ribs. They are more serious on the left side from the spleen, kidney, and splenic flexure involvement. These wounds are often caused by shrapnel or shell fragments. Access to this region is not easy; the wounds are therefore difficult and unsatisfactory to treat.

Wounds between the transpyloric and intertubercular planes are very serious. Above the umbilicus they are like those above the transpyloric plane, and below the umbilicus the small intestine is involved.

Anteroposterior shots in the midline are seldom met with. On either side, in the upper part of this region the colon is involved and injuries to it are easily dealt with. Lower down, near the midline, the wounds are grave as they involve the small intestine. Toward the sides in the lumbar regions, we find wounds of the ascending or descending colon. If the peritoneal surface alone is involved the danger is not so great unless the wound in the wall is large. Wounds in the left lumbar region are very much more dangerous as the coils of jejunum overlie the great bowel. In flank wounds the colon and peritoneum may both escape owing to the thickness of the abdominal wall.

Wounds entering the back in this region are apt to plough up the retroperitoneal tissue by mechanical violence or by subsequent hæmatoma, and they are consequently more fatal than anteroposterior wounds. Single entry wounds of the loin often injure the retroperitoneal tissue and pass into the colon. Shell fragments and wounds in this location are grave; they cause a large opening with escape of fæces but free drainage and the fact that the traumatism is in plain view assists in the steps to be taken. This is seldom the case in wounds caused by smaller projectiles where leaks in the retroperitoneal tissue may occur which may cause death before sufficient drainage is provided.

Side-to-side wounds are very fatal. If the small and large intestines are both involved, the spine or great vessels are injured since the vertical colons are set well back. For this reason side-to-side wounds which involve the small intestine alone seldom include the colon. The amount of damage done varies. In some cases the gut is lacerated and cut across, the transverse colon and central portion of the stomach may be all but completely cut by one bullet. There may be only clean cut perforations or the peritoneum only may be penetrated.

All wounds below the intertubercular plane are very serious. They include shots through the hips, thighs, and buttocks.

Anteroposterior wounds in the hypogastric region are very serious, especially when compared to anteroposterior shots in the epigastric region. Midline wounds are fairly frequent; the bladder is not often implicated unless it is full at the time of injury; the pelvic colon and rectum may be involved.

In the iliac regions the iliac colon and cæcum may be implicated.

Side-to-side wounds are very serious. Small intestinal wounds are nearly always multiple, the bladder and rectum wounds may be intra- and extra-peritoneal.

In vertical wounds the wound of entry is often through the buttock, peritoneum, or thigh, and the iliac vessels may be involved. The peritoneal wounds are often overlooked, but pain in the abdomen is often present and should lead to suspicion of internal injury. The fatality in these cases is due mostly to hæmorrhage from the iliac vessels and the fact that peritoneal wounds are often overlooked. Wounds of the rectum are quickly fatal from peritonitis.

The possibility of a bullet traversing the peritoneal cavity without injury to the viscera is discussed in an interesting way. The author gives a chart which shows a number of cases in which the abdomen was opened for exploratory laparotomy and in which no hollow viscera were opened although the entrance and exit wounds clearly pointed to such an injury. In these operations tears of the peritoneal coats of the hollow viscera, stomach, or intestine, were not infrequently seen, a fact which would indicate that even a modern bullet can push aside the visceral wall without perforating it. Such cases are believed to account in a certain proportion of cases for complications like fæcal fistula and intraperitoneal abscess.

Determination of peritoneal involvement to make sure that the wound is penetrating is frequently difficult. This is especially true when there is no wound of exit. Symptoms of shock, hæmorrhage, rigidity, peritonitis, and rapid pulse point to penetration, but these are not always present.

Below the transpyloric plane an entrance wound on the right of the midline and the exit wound anterior to the right lateral line of the body is apt to be non-penetrating. On the other hand above the transpyloric line such a wound is almost sure to be penetrating. In the longitudinal direction an entrance wound near the costal margin with an exit wound above the groin points to penetration.

In the case of single entry wounds the symptoms alone indicate penetration or non-existence of peritoneal involvement.

A vertical wound entering from the thorax may give no sign for some time. A vertical wound entering from the buttock is apt to be attended with pain at the time of injury.

Absence of liver dullness is no criterion of visceral penetration. Abdominal injury from a bomb explosion which exhibits multiple small wounds may be attended with doubt as to the existence of penetration. Rather than explore one or two of these wounds for the purpose of diagnosis it is best to make an abdominal incision, and to be guided in accordance with the findings. The author has found as many as 14 perforations in the small gut from small fragments issuing from one bomb.

Symptoms of peritoneal involvement are generally: (1) rigidity of the belly wall; (2) rapid pulse; (3) indications of hæmorrhage; and (4) absence of liver dullness.

Rigidity is seldom absent after 4 to 5 hours; the same is true of the rise in pulse-rate. Local trauma without penetration may show rigidity but the pulse-rate may not rise.

Symptoms of hæmorrhage are hard to distinguish from shock. There is blanching and rapid pulse in both. In the case of hæmorrhage restlessness is seldom seen. The same is true of air hunger and failure of sight. The amount of hæmorrhage is generally very great before dullness can be of significance as a symptom.

Retroperitoneal hæmorrhage causes decided abdominal rigidity and well-marked shock.

The effect that shock, hæmorrhage, peritonitis, and septic infection of the retroperitoneal tissue have in causing death is shown as follows:

1. The amount of shock is usually severe and it may be absent or nearly so for a number of hours. What actually causes shock is undecided. Usually it is proportional to the extent of the injury; but profound shock may be present with a limited lesion or may be nearly absent in an extensive one.

2. Hæmorrhage is probably the most frequent cause of death. Its source is from (1) great vessels, (2) the mesentery, (3) the omentum, (4) the abdominal wall and retroperitoneal tissue, and (5) the solid viscera. Of these, the mesenteric are the vessels most frequently found bleeding when the abdomen is opened.

3. Peritonitis is the common cause of death, sometime after injury. It may be fatal within twenty-four hours if the infection comes from a wound of the rectum.

4. Infection of the retroperitoneal tissue may come from the bowel or the bacillus aerogenes capsulatus. In the case of the former the infection usually comes from wounds of the colon.

Trench fighting has permitted the establishment of well-appointed operating centers close to the fighting line, so that cases of abdominal wounds can be collected rapidly into an operating room under the management of expert abdominal surgeons. This fact has materially changed the management of abdominal wounds in military surgery. The conditions on the western front so far as this class of wounds is concerned approximate those in civil practice in well-appointed hospitals in which the surgeons control all the environments. The rule of operating early has become the vogue at the casualty stations on the western front. The rest-treatment supplanted by morphia, which obtained in the Spanish-American, Anglo-Boer, Russo-Japanese, and other recent wars in which the mobile armies were fighting in the open, is no longer favored.

In caring for patients before operation morphine is at once employed for the relief of pain and to allay anxiety during transport to the casualty station. Fluids should be administered in very moderate quantities. On reaching the operating hospital the patient is put to bed, and is given subcutaneous saline for the treatment of shock. If no improvement takes place hæmorrhage is probably present and operation should be undertaken. If hæmorrhage is found the chances of saving the patient's life are good.

At operation a paramedian incision is employed and it should be used in all cases unless it is contra-indicated. A long incision saves time and shock. The first indication is to arrest hæmorrhage and the second to systematically examine for wounds of the hollow viscera.

In resection circular enterorrhaphy is better than lateral anastomosis. Lesions of the small bowel must be dealt with first and the colon next.

The author gives no figures on the results of the cases operated upon but he promises to do so when a series of cases has been collected for six months. He states that the results secured so far indicate positively that the mortality at the casualty clearing stations has been very much reduced by early operative interference. LOUIS A. LAGARDE.

Austin, A. E.: Simulation of Œsophageal Stenosis by Extensive Carcinosis of the Lesser Curvature of the Stomach. *Boston M. & S. J.*, 1916, clxxiv, 44.

The author reports two personal cases and two cases gathered from the literature which simulated

œsophageal stenosis but proved to be carcinoma of the lesser curvature of the stomach.

The diagnosis is difficult. The vomitus may be free from hydrochloric acid and contain lactic acid in both conditions. Blood may be present in both. The stomach-tube may meet obstruction at the cardiac end of the stomach in both conditions, and in X-ray examinations bismuth has been found in the œsophagus thirty-five minutes after ingestion in cases of carcinoma. The deglutition sounds are unsatisfactory. Hoarseness and aphonia are suggestive of an œsophageal growth.

In summing up, the author says that "when we come across symptoms of dysphagia relieved by water-drinking, with inability to pass a soft tube, or difficulty in its passage at a point near the cardia, with eructations of food without hydrochloric acid and with rennin present, without a tumor in the abdomen but rigidity of the gastric borders, we are not to decide at once that we are dealing with œsophageal stenosis, but sometimes with general carcinosis of the stomach." D. H. Boyd.

Troell, A.: Gastroptosis (Ein Beitrag zur Gastrotosefrage). *Arch. f. klin. Chir.*, 1915, cvii, 239.

In a work on gastroptosis written in 1913 Rovsing very enthusiastically advocated operation for this condition. Troell thinks that this enthusiasm is not justified by the results of operation, and in support of his opinion gives histories of 8 cases of gastroptosis in which he has operated or assisted in the operation. From his experience Troell concludes that there are no definite clinical symptoms due to changes in the position and mobility of the stomach alone, and that it is impossible to designate any definite degree of such change as being pathological. Most of the patients are women of slender, delicate build with unstable nervous systems, frequently with ptosis of other abdominal organs, retroflexion of the uterus, and a condition which may be described as universal asthenia. Gastropexy is not a procedure that can overcome such a condition.

The roentgenograms show that in some of the apparently successful cases of gastropexy there was really little change in the position of the stomach; in some cases there was improved position but even less motility. There is of course danger of attributing such cases to neurosis and not giving adequate treatment; but an overhasty surgical treatment without precise indications is equally unjustifiable. Roentgenoscopy should be utilized, not only in diagnosis, but later to determine the objective results of treatment. A. Goss.

Meyers, S. J.: Preliminary Note on the Treatment of Visceroptosis. *Internat. J. Surg.*, 1916, xxix, 15.

In a short preliminary note Meyers reports his results in three cases of marked visceroptosis through the use of the "Rose binder." The binder is indicated for those cases showing no positive evidence of existing pathology, except a general abdominal ptosis, accompanied by indefinite or obscure digestive and nervous symptoms.

The binder is of adhesive plaster, 36 inches in length by 8 inches wide. The lower border tapers from the center to about 2 inches wide in the back, a notch being cut in this edge to avoid contact with the iliac crests.

The bandage is applied in the exaggerated Trendelenburg posture with the widest portion immediately above the symphysis. It is then reinforced by applying a 2-inch strip upon each side extending to a higher point on the back. The bandage thus applied may be worn indefinitely without producing serious cutaneous irritation, although as a rule it is renewed at the end of a week. P. M. Chase.

Tinker, M. B.: What Stomach Symptoms Justify Surgical Intervention. *N. Y. St. J. Med.*, 1915, xv, 460.

Surgical intervention is justified in a large number of cases on the basis of a carefully taken history alone. When the history shows that there have been repeated attacks of indigestion with intervals of good health, severe epigastric pain, frequent vomiting, hunger pain and relief by taking food, unrelieved by a reasonable course of medical treatment, operation seems justifiable. If, in addition to this, the X-ray shows delay in emptying the stomach from partial obstruction, deposit of bismuth in chronic perforated ulcer, or great irregularity in stomach contour, the indication seems still stronger. If analysis of the gastric contents shows the presence of hyperacidity in ulcer cases or the absence of free hydrochloric acid with lactic acid in cancer cases, this is also strong confirmatory evidence. Blood, though not so frequently present, either vomited or obtained microscopically or shown as occult blood in the stools, is also valuable evidence.

While it may be impossible to arrive at a positive diagnosis in many of these cases, it is almost always possible to say that serious trouble is present inside the abdomen, and that the symptoms are of sufficient gravity to justify surgical intervention. Almost always it will be possible to determine with some degree of certainty whether the stomach and duodenum are at fault or whether the stomach symptoms are caused by lesions elsewhere in the abdomen. All modern means of diagnosis should be employed and the lesion located as definitely as possible so that in the majority of cases the operation is not really exploratory, but the lesion causing the symptoms may be attacked without undue handling of the intestines or manipulation inside the abdominal cavity. Edward L. Cornell.

Freeman, L.: The Use of Free Omental Grafts in Abdominal Surgery. *Ann. Surg.*, Phila., 1916, lxiii, 83.

One of the normal functions of the omentum is to seek out and attach itself to raw or inflamed peritoneal surfaces. When the inflammation has

subsided, the adhesions tend to disappear; therefore it appears entirely rational purposely to make use of this function in abdominal surgery.

The author recommends free omental grafts in the following conditions:

1. In the replacement of lost portions of peritoneum where suitable flaps of peritoneum cannot be obtained. Free grafts are preferable to implants of fixed omentum because of the tendency of the latter to form constricting bands, and once fixed, the omentum could not migrate to the other portions of the abdomen where its help might be needed.

2. In the prevention of adhesions, omental grafts have been proved experimentally efficacious, and clinically the author has had satisfactory results in using them to cover raw surfaces after separating adhesions between adherent coils of intestine.

3. In the strengthening of suture lines in operations upon the stomach and intestines the free omental graft is well suited except when there is actual gaping of the wound or great tension. The graft should be large enough to reach well beyond the line of suture and be firmly secured by many sutures.

4. In pyloric and intestinal occlusion, twisting the grafts into cords and stitching the ends after encircling the parts to be occluded affords results superior to the use of foreign constricting material. In the checking of hæmorrhage omental grafts are of unequaled value, not only for the oozing of raw surfaces but for spurting arteries as well; and especially for stopping hæmorrhage from wounds in the liver.

The author draws attention to the following precautions: (1) In tying off the grafts sufficient ligature should be used so as not to pucker the pedicle into a bunch. (2) The graft should be excised as far from the base of the omentum as possible, and large vessels avoided. (3) No more tissue should be sacrificed than is positively necessary. (4) A number of stitches of fine cat-gut should be used to hold the graft in place. (5) The graft should entirely cover and project over the sound tissue on every side of the raw area.

Of the four objections, (1) multiple foci of hepatic necrosis; (2) gastric and duodenal hæmorrhage; (3) the omentum might be required for other purposes; (4) the danger of adhesions to the raw omental stump, only the first two require serious consideration. Both are due to thrombosis, the first, venous, extending to the right epiploic vein and thence to the liver; the second, arterial, giving rise to emboli of the right epiploic artery. Both are exceedingly rare, and both may be avoided by avoiding large vessels and by ligating far from the base of the structure. E. FISCHEL.

Haynes, I. S.: The Significance of Pyloric Spasm. *Am. J. Surg.*, 1915, xxix, 425.

Haynes makes a careful résumé of the anatomy, physiology, etiology, symptoms, diagnosis, and treatment of pyloric spasm, defining it as a spasmodic contraction of the pyloric ring, pyloric canal, or both.

Haynes quotes the classification of Brown whereby eleven sources are enumerated from which pyloric spasm may result. There are many conditions that may produce pyloric spasm but there are only a few that commonly do so. Gall-bladder, chronic appendix, ulcer in the stomach or duodenum, are common causes mentioned.

The medical aspect is not discussed, but the author regards the recent work of Sippy, whereby delay is advised in gastric cases, as a step backward. Each year 26,000 people are dying in the United States from cancer of the stomach, 70 per cent of which develop on an ulcer base, so that thousands might be saved by appropriate surgical interference.

The author's conclusions are:

1. It is not humanly possible to determine the time when malignancy begins in an ulcer.

2. Operation should be performed early in all cases of ulcer. Nothing but early excision offers hope of cure of cancer wherever placed.

3. Sippy's procrastination teaching is retrogressional. All chronic cases should be treated surgically.

4. Gastro-enterostomy, cautery excision, pyloric excision, and pyloroplasty are methods which have been successful in his hands. H. G. GARWOOD.

McGuire, E. R.: Surgery of the Duodenum. *Long Island M. J.*, 1916, x, 28.

The author asks how cases of duodenal dilatation without apparent obstruction can be explained; why there should be such a high toxicity to obstruction of the duodenum; why ulcer occurs so frequently in the first portion of the duodenum; why ulcer on one side of the pylorus is so prone, and on the other so resistant, to malignant change. Embryologically, the dividing line between the stomach and the duodenum should be placed at the junction of the foregut with the midgut and thus the first portion of the duodenum should be considered as a part of the stomach. Failure of accurate union of the fore- and midguts may explain partial obstruction of the lumen.

Recent work on duodenal obstruction shows that the duodenal mucosa may possess some peculiar toxic property, even without visible change in the outer coats, suggesting the need of removing the mucosa by resection in delayed cases where the intestinal wall seems viable.

Lesions in the upper abdomen impress one as being secondary to infective processes elsewhere, most frequently in the tonsils or teeth, and are frequently correlated with an abnormal appendix or with intestinal stasis. The question whether ulcers undergo malignant change is not settled and until it is, excision must be considered in the treatment of these lesions.

The conditions in the duodenum demanding surgery are congenital obstruction, ulceration with

later obstruction and perforation, the treatment usually being a question between excision and gastro-enterostomy. The latter operation is not ideal, but is frequently an operation of necessity. The excellent results following gastro-enterostomy occurred in those cases where healing of the ulcer caused sufficient contraction to close the pylorus. Experimental closure of the pylorus was attempted in a variety of ways on animals, in one group without enterostomy, as a result of which it was found impossible to produce obstruction by excising any amount of duodenal wall in a normal duodenum, and in a second group with gastro-enterostomy, using many different varieties of sutures, none of which were absolutely trustworthy. The most certain method was complete division of the duodenum with suture of both ends as practiced by von Eiselberg. Clinically, however, it was found that by any method sufficient occlusion took place to send most of the bismuth through the anastomosis. In the human, because of the contraction of the ulcer in healing, any operation for pyloric occlusion is probably unnecessary. If a permanent block, for any reason is desired, probably the ideal method is that of von Eiselberg; but in view of its greater danger it should not be attempted in any but exceptional instances, the ordinary infolding suture offering a sufficiently reliable method for most cases.

E. K. Armstrong.

Parham, F. W.: Chronic Intestinal Obstruction Versus Intestinal Stasis. *Old Dominion J.*, 1916, xxii, 1.

Two cases of chronic intestinal obstruction are reported, in the first of which the characteristic symptom was colicky pain occurring spasmodically, accompanied by diarrhœa alternating with attacks of constipation. X-ray barium pictures showed a distinct halting of the stream in the region of the sigmoid, corresponding with the point of pain reference, at which location a tumor was found. The pain was relieved by removal of this cause of incomplete obstruction. The second case was also characterized by the almost pathognomonic signs of partial intestinal obstruction, paroxysmal colicky pain relieved by a bowel movement. The X-ray observations were confusing. The opinion had been expressed that the trouble was due to intestinal stasis without organic constriction. The patient elected medical treatment under other hands and died six weeks later. Post-mortem examination showed that death was the result of jejunal intussusception of late development. The lumen of the descending colon was found narrowed just below the splenic flexure and this undoubtedly explained the pain and deterioration of health consequent upon the intestinal toxæmia.

The lessons to be drawn from these cases are that the diagnosis of intestinal stasis discourages resort to exploratory investigation and the possible discovery of the true cause of the trouble. The X-ray examinations are invaluable as an aid in diagnosis, but sole reliance must not be placed upon laboratory interpretations, which must be in accord with the symptoms or otherwise rejected. E. K. Armstrong.

Ladd, W. E.: Intussusception. *Boston M. & S. J.*, 1915, clxxiii, 879

During recent years the mortality rate at the Infants' Hospital and Massachusetts General Hospital has been rapidly lowered, for the reason that cases are diagnosed earlier than in former years.

A significant history of intususception is the following: A baby apparently well is seized with severe pain, turns pale, and vomits. Following this the child has intervals of feeling almost well, and then a recurrence of pain occurs, with drawing up of the legs. In five to six hours a bloody stool is passed. A mass is usually felt at this period and the diagnosis should be comparatively easy. Later when tympanitis has set in with rapid pulse, fever, and leucocytosis, the chances for recovery are small. Operation should be performed in the early stages before these later symptoms have developed.

J. H. Skiles.

Ochsner, A. J.: Intestinal Stasis. *Surg., Gynec. & Obst.*, 1916, xxii, 44.

This subject has received much attention throughout the history of medicine from physician and layman alike.

During the past decade, Lane and his followers have made a surgical disease of intestinal stasis.

In the selection of cases for surgical treatment, the author advises the rejection of neurotic patients whose condition is not directly due to intestinal stasis.

The operative treatment should be limited to cases in which the stasis is due to a mechanical condition which can be relieved by a surgical operation.

The principal symptoms upon which a diagnosis can be made are described.

Sixteen X-ray plates taken from typical cases show that without a complete history and careful physical examination, the X-ray examination is likely to lead to serious errors. In order to be of value, the X-ray examination must be conducted by the clinician who follows his surgical cases into the operating room.

In case the operative treatment, which the author considers necessary in less than 10 per cent of all cases suffering from intestinal stasis, is indicated, the methods recommended by Lane should be followed with the addition of implanting the portion of the severed ileum which remains attached to the cæcum into the abdominal wall through a muscle-splitting opening in patients who suffer also from neurasthenia, in order to enable the surgeon to flush the entire colon at any time when there may be an accumulation of excrement in that viscus.

Short abstracts of some of the most important papers which have recently appeared on this subject conclude the paper.

Smithies, F.: Chronic Intestinal Stasis and Its Associated So-called Toxæmia. *Surg., Gynec. & Obst.*, 1916, xxii, 57.

Smithies maintains that clinically there is no definite class of cases whose physical make-up is grossly altered by chronic intestinal stasis. While many cases of the ailment conform to the "Lane type," a great group of patients with obstinate constipation are well nourished, full-blooded, and mentally alert. Smithies does not consider that the X-ray method of estimating the length of time for the passage of material through the large bowel is a dependable guide for the indication of stasis. He does not think that the so-called "motor meals" are physiological or comparable with meals of ordinary food which the patient has chosen himself. Not only do X-ray motor meals show great variations in the length of time which it takes them to pass through the colons of different subjects, but the variation is often quite marked when the same patient is observed at different times. Many individuals who have normal evacuations from the bowel can be shown to have stasis by an X-ray motor test-meal. An incompetent ileocæcal valve appears to have no definite causative relationship to chronic intestinal stasis. Such findings are observed irregularly in individuals who are constipated, who have normal stools, or who are diarrhœic. X-ray plates made after colon injections may in the same individual or in different individuals show wide variations in the shape and position of the colon. These variations may have no bearing whatever as causative factors in the production of intestinal stasis.

Smithies does not think that experimental proof is at hand to demonstrate that harmful chemic or bacteriologic agents are absorbed into the system from the bowel in cases of intestinal stasis, and that the absorption of such materials is responsible for the widespread general disturbances described by Lane.

The author is inclined to believe that the alterations in the colon which are associated with chronic intestinal stasis are in large part secondary to chronic malnutrition in individuals who have local or general foci of chronic infection, such as head sinuses, germ centers about the teeth, tonsils, appendix, gall-bladder, uterus, tubes, etc.

Respecting the treatment of chronic intestinal stasis, Smithies urges that there be earnest co-operation between patient, surgeon, and internist. Before permanent good can be done by hygienic, dietetic, gymnastic, or medicinal procedures, he suggests that the surgeon should eradicate local infected foci wherever they may be located. If abdominal operations are decided upon they should be exploratory in the fullest sense of the term. Only where definite mechanical faults in the structure of the large bowel are demonstrated should "short-circuiting" or resections be performed. Some of the cases where "short-circuits" or resections have been performed, have, in the author's experience, later shown most obstinate constipation or diarrhœa and have often been associated with anomalies in the digestive quality of the secretions of the stomach, liver, and pancreas.

Knight, A. L.: Recent Research Work in Intestinal Stasis. *Lancet-Clin.*, 1915, cxiv, 491.

The author of this article does not pretend to offer anything new, but in view of the importance of the experimental work done, he ventures to present a summary of the findings of Keith and Alvarez who have done some very important research work in this connection.

At the present time the problems of intestinal peristalsis, or lack of it, are receiving much attention, no doubt in great part because of the brilliant and radical work of the surgeons in the field of intestinal surgery. Keith's anatomical researches seem particularly valuable. It will be remembered that Keith and Flach, amplifying the work of His and Tawara, demonstrated the peculiar properties of the nodal tissue in the heart, both physiologically and anatomically. They demonstrated the anatomical verity of a peculiar tissue apparently intermediary between sympathetic nerve-tissue and unstriated muscle, having its node of greatest excitability definitely located at the sino-auricular bundle, and its final distribution to both ventricles. This tissue has within itself the power of originating and carrying on impulses, of maintaining tonicity, of responding to exciting agents, and of avoiding tonic spasm under ordinary, and, to a great degree, extraordinary stimuli. In that the heart and intestine have analogies in structure and function, and possibly in the manner of development, Keith thought that nodal tissue should be found in the intestine.

In the fully developed intestine, the myenteric plexus seems of a very complex texture. In addition to the ganglionic cells and much fine nerve-fiber network, Keith describes what he calls a third element in the plexus, which he says is very abundant — branching intermediate cells which appear to become continuous with processes of certain groups of muscle-cells on the one hand, and with the branched processes of ganglionic cells contained in the nerve-fibers of the plexus on the other. This myenteric tissue can be demonstrated to be true nodal tissue, having the power of maintaining tonicity, of originating and conducting impulses, and of reacting in a specific manner to specific stimuli. There are points in the digestive tract where this tissue is particularly well developed, and from which peristaltic movement seems to originate, that is, points that are true nodal centers or pacemakers, notably at least anatomically, that center at the ileocæcal junction.

Keith believes that there is a pace-maker for the stomach at the gastro-œsophageal junction.

Throughout the entire intestine, and notably at its points of greatest tonicity — the pylorus, termination of the ileum, and descending colon, myenteric tissue can be demonstrated, often traveling in

sheaths, giving off through slits in the sheath dentrites into the musculature that quickly are lost in muscle-cells, and all so far as is known, pointing one way — down the gut. Keith also calls attention to the enormous amount of glandular structure in the large intestine — considerably greater in bulk than the pancreas — and that it is of unknown, or, at least, uncertain function; also that the amount of muscular tissue in the large intestine is greater than that in the biceps, and Keith uses these as arguments against the "effluent sewer" idea of the colon.

Alvarez has demonstrated, apparently with certainty, that duodenal movement is more rapid, shallower, and more intermittent than jejunal, and jejunal than ileal; that waves do not move from one end of the small intestine to the other, but rather over tracts that seem to be fairly well defined by the old anatomical divisions.

The pathological morphology has been carefully considered in a few cases where the major portion of the great intestine has been excised for mucous colitis (or intestinal stasis) and the pathologic conditions in these cases seem quite clear. The process of inflammation in the intestine is probably not different from similar processes elsewhere, particularly in those structures where mucous membrane is first involved.

Keith made a section across the muscular coat of the ascending colon from a case of mucomembranous colitis which shows the hyperplasia and beginning fibrosis. All the tissues seem increased in amount, fibrous sheaths have formed about the musculature, and the process of fibrosis has invaded the myenteric tissue and is beginning to destroy cells and dentrites. This chronically inflamed tissue would naturally be in a state of chronic excitability, consequently in a state of hypertonus, and Keith is convinced that in a great majority of cases which are classified under the somewhat elastic term of "intestinal stasis" the symptoms do not result from an atony of the musculature of the bowel, but from a hypertonicity of those parts which are normally in a state of tonic contraction.

Do kinks cause stasis? If so, it would be expected that stasis would be demonstrated in radiographs, at the hepatic flexure or in the ascending colon, which seems never to be the case, but stasis is demonstrated radiographically almost invariably proximal to rich distributions of myenteric tissue.

It may well be said that although at post-mortem there is no apparent anatomical lessening of the lumen of the bowel, the hypertonus, which we might compare to tonic spasm, creates a very real condition, calling for relief. J. F. CASE.

Benmosche, M.: Second Report on a New Method for Facilitating Intestinal Anastomosis. *Internat. J. Surg.*, 1916, xxviii, 410.

The author presents a mold of gelatine for making either an end-to-end or a lateral intestinal anastomosis. The mold for the end-to-end anastomosis is a tube with a groove around the middle. The divided ends of the gut are brought together over the mold and united at the groove. The mold for the lateral anastomosis is the general shape of a collar button with a lumen through the shaft. The button part at either end is slipped into the opening made into the intestine, the ends for anastomosis being then brought together and sutured over the shaft.

The advantage of this "gelatine bolus" is that it dissolves in three or four hours leaving a united bowel free to heal without the interference of any mechanical foreign body. The method is a rapid one, hence, minimizing shock. The gelatine undergoing solution has hæmostatic value.

HENRY J. VAN DEN BERG.

McWhorter, G. L.: A New Method of Intestinal Anastomosis with a Study of the Intestinal Movements After Its Use. *J. Am. M. Ass.*, 1916, lxvi, 86.

The author's technique of the right-angle anastomosis is modified from the circular end-to-end method, in that the bowel is cut at an angle of 45 degrees, leaving the oblique mesenteric sides. The mesenteric portions are approximated first by a mattress suture, which, when tied on the inside, occludes the uncovered area of the bowel and invaginates the edges. With a needle on each end of this suture, the sutures are continued around so that this mesenteric half is first sutured accurately with a hæmostatic buttonhole stitch. These are then continued as Connell sutures, ending at that portion of the bowel opposite the mesentery. A Dupuytren stitch is then taken outside the first stitch to approximate a wide area of serosa. A few stitches join the mesenteries. If the ends are of unequal size, one may be cut more obliquely or an incision may extend up opposite the mesentery, as Curtis suggested in the end-to-end union. Where a lateral implantation is desired, the end may be cut obliquely as above. The right-angle union has advantages over the usual end-to-end in that it not only has a richer blood supply, but the angle of the blood-vessels toward the union lessens the danger of the second row of sutures causing gangrene of the inverted margin of the bowel. There is, therefore, less danger of leakage at the suture line, and also of contraction and stenosis. This can be done as simply as the circular union.

In the method of notch enterorrhaphy, the area to be resected is decided upon, soft jawed clamps covered with rubber may be applied to prevent the intestinal contents escaping, and the field is packed off with moistened gauze. The mesenteric vessels supplying the bowel to be resected are ligated. Double clamps are put on the ends of that portion to be resected. The bowel is cut between the clamps with a cautery, leaving them temporarily on the ends to be united. The ends of the bowel that are to be united are overlapped for union as far as desired, restoring the direction of peristalsis. The

overlapping of about 2 inches is usually satisfactory. A Dupuytren stitch taken along the sides near the mesenteries approximates them. The clamps temporarily holding the ends of the bowel closed may now be cut away, leaving healthy bowel ends. The sides of the intestines which approximate each other are nearly cut away, beginning at the end of the lumen, leaving a small edge of the side near the mesentery for the approximation of serosa by an inner stitch through all of the coats of the bowel. A similar width of the bowel is left on the convex side for approximation and invagination by sutures. These notched sections of bowel left should have rounded corners in order that they may be accurately approximated, though nearly a rectangle has been removed. A hæmostatic buttonhole stitch is started on the side near the mesentery through all of the coats of the bowel, continuing around the other side as a Connell suture invaginating their edges. The Dupuytren stitch previously started is now continued around the first suture line, approximating a safe margin of serosa and completely re-establishing the bowel both as to shape and size. The edges of the two overlapping mesenteries are stitched down with a few interrupted stitches.

Animal protocols are appended and the results of X-ray findings noted. The following conclusions are reached:

1. There are distinct advantages of the notch and right-angle over the circular end-to-end and lateral anastomoses.

2. There is as early a resumption of physiologic function in the notch and right-angle anastomoses as in the circular end-to-end.

3. The pylorus, if controlled in dogs by a special protective mechanism, does not delay the food there from five to six hours after a high intestinal union, while the gastric peristalsis is active, as described by Cannon and Murphy in cats. There may be no demonstrable delay or there may be a short delay in certain cases.

4. Following any intestinal anastomosis, a localized loss of motor function remains, and possibly a general reflex sluggishness of the intestinal tract, varying to some extent with the degree of trauma, emphasizing the importance of delicate surgical technique.

5. There may not, necessarily, be a complete temporary loss of gastric motor function after necessary surgical handling for union to the bowel.

EDWARD L. CORNELL.

Lyle, H. H.: Left-Sided Appendicitis Complicating Transposition of the Viscera. *Ann. Surg.*, Phila., 1916, lxiii, 124.

Lyle reports a case in which the history was that of a typical attack of appendicitis with abscess, the pain and mass however being on the left side. The heart was on the right side. The diagnosis was confirmed by operation and X-ray plates. Fourteen transposition cases have been noted at St. Luke's Hospital, N. Y. ISIDORE COHN.

Roux, J.: Appendicostomy (Quelques cas personnels d'appendicostomie). *Rev. méd. de la Suisse Rom.*, 1915, xxxv, 814.

Roux has found appendicostomy of great value in cases of gastro-intestinal perforation followed by acute peritonitis. The nausea, vomiting, and cardiac and pulmonary symptoms are due to paralysis of the intestine. Drainage through the appendicostomy opening overcomes this paralysis and re-establishes normal peristalsis. At the time of the operation, the appendix is brought out and fastened in a buttonhole incision in the abdominal wall; its distal end is opened and drainage established through it by the drop method. This opening provides for the discharge of gases, but this is its least important function. The fluid introduced through the appendix is absorbed to such an extent that no other fluid need be given. Nothing need be given by the mouth until normal conditions are restored in the intestine. Generally after about twelve hours, the fluid discharged through the rectum is colored with bile, showing that the intestinal paresis is overcome.

Appendicostomy can be performed easily and quickly and does not prolong the major operation more than two or three minutes; it is followed by immediate and abundant absorption of water, which prevents shock, and rapid disintoxication is brought about by the lavage of the whole of the large intestine; siphonage of the small intestine is also accomplished. Appendicostomy is painless; it places the sutures at rest if they are above the colon, and the fistula is easily closed when its work is done.

Roux describes ten cases of his own, in one of which the bowel had been perforated in eight places by a bullet; two of the other patients had been run over by vehicles. Most of the other cases were perforated gastric ulcers. The appendicostomy gave results in these severe cases that he thinks could not have been obtained by any other method of treatment. A. Goss.

Strauss, A. A.: Complete Exclusion of the Large Bowel; Submucous Free Fascial Transplant Method, with Ileosigmoidostomy. *J. Am. M. Ass.*, 1916, lxvi, 267.

It has long been recognized that ileocolostomy alone nearly always results in a certain amount of regurgitation along the colon and cæcum or the contents passes by the ileosigmoidostomy and follows its normal route. Colectomy has been advised by many for this reason, but once done the normal course of the intestinal contents along the colon could never be re-established. Several methods have been used to stenose the bowel, but none of them have been perfectly satisfactory, the sutures sloughing or it being impossible to close the bowel over a fascial transplant. The author offers a method of excluding the colon by submucous transplant which is efficient and simple. A flap is resected from the anterior sheath of the rectus, three quarters by one inch. The ileum is picked up three inches from the ileocæcal valve and the muscu-

lar coats are divided down to the mucosa. The muscle is then stripped away from the underlying tissue very easily. A forceps is passed underneath the mucosa and the fascial transplant pulled through and sutured in such a manner as to hold the bowel in a collapsed condition. The muscularis is then closed over this and an ileosigmoidostomy performed in the usual manner.

Twelve dogs were thus operated upon, and at the end of four, six, and nine months necropsy showed the colon to be normal in every way. Ten more dogs were operated upon by the same method, except that the colon was closed in the same manner, completely excluding that structure. In six of these dogs the colon was emptied with apomorphine, while in four the bowel was not emptied, in order to see what effect the presence of intestinal contents would have on the general health. In all, except two that died from infection immediately after operation, necropsy showed the colon to be contracted down and the closure water-tight. In the four animals in which the intestinal contents were left *in situ* there was an inspissated mass above the colon closure, which, however, seemed to have no ill-effects on the animal.

The author concludes that while some of the contents found in the colon are the result of regurgitation, most of it is due to food passing by the ileosigmoidostomy into the cæcum and colon. Probably simple closure of the ileum below would suffice in most cases, and this would be safe in man.

E. K. Armstrong.

Schoemaker, J.: Surgery of the Large Intestine (Kasuistisches und Technisches aus der Dickdarmchirurgie). *Arch. f. klin. Chir.*, 1915, cvii, 195.

Schoemaker describes three cases of ileus in old people more than seventy-five years of age. In the first case he made a diagnosis of obstruction from carcinoma but on opening the abdomen no mechanical obstruction of any kind could be found. He lost so much time in searching for the obstacle that the patient died. In the second case he made the same diagnosis, but remembering his first experience, when he could find no tumor he simply made an artificial anus and terminated the operation. Normal intestinal function was restored and the patient recovered. In the third case when no tumor or stenosis could be found he simply inserted a small drainage tube into the intestine and after normal function was restored removed it, when the fistula closed of itself. This dynamic ileus is given little attention in textbooks on intestinal surgery. In about 99 per cent of cases of ileus there is mechanical obstruction, but the surgeon in operating should bear in mind the possibility of this acute dynamic atony in order to avoid such a mistake as the author made in his first case.

He also describes two cases which had all the symptoms of appendicitis, except that they were on the left side. Laparotomy revealed the fact that in each case an appendix epiploica had developed a cavity in the center lined with a continuation of the intestinal mucous membrane forming a diverticulum. In each case there was a very minute perforation of this diverticulum, resulting in peritonitis. Both patients recovered.

The author also describes his technique for resecting the large intestine without opening the lumen. When the point for making the resection is located he makes an incision down to the submucosa and pushes back the muscularis and serosa with the knife, leaving a tube of mucosa about 1 cm. long. He then puts two small clamps on the intestine and makes the incision, cutting so close to the clamps that no mucosa is left adherent to their outer surface. The resection is made in the same way at the other end and then the clamps remaining on the proximal and distal ends are brought together. The mucosa and serosa are now sutured over the clamps, and before the last suture is tied the assistant pulls out the clamps while the surgeon is tying the knot, so the intestine is sutured without having had the lumen opened. The method is illustrated. Schoemaker had to have a special forceps constructed as he found that the ordinary ones slipped off the intestine when the mucosa was cut off close up to them.

A. Goss.

Venable, C. S.: Stricture of the Rectum. *Texas St. J. Med.*, 1915, xi, 441.

Gonorrhœa of the rectum, ulcers, fistula, and the aftermath of operations or perirectal and other pelvic inflammations are much more frequently responsible for annular stricture of the second and third parts of the rectum than is syphilis. Forceful dilatation of such strictures is always dangerous and at best is but a palliative measure. Therefore, it is the author's custom to operate, his technique being as follows: After thorough divulsion of the sphincters, a circular incision is made at the skin margin and the rectum freed; the gut wall is then dissected free in the perirectal plane until the base of the stricture is reached. Dissection is made around, not through this; once beyond the base, blunt dissection is continued until the rectal wall beyond the stricture or gut end of the fistula can be brought to the skin margin without tension. Sutures are then introduced and drainage provided for. With good technique and careful after-treatment permanent relief is afforded in most cases. Lister Tuholske.

McGavin, L.: A Case of Abdominoperineal Excision of the Rectum. *Clin. J.*, 1915, xliv, 385.

The author presents a case of carcinoma of the rectum and discusses the salient points in the treatment of this condition.

Bleeding is very often the first symptom and may occur without pain. In contradistinction to hæmorrhoids the pain is not relieved by bleeding; also the bleeding in carcinoma is usually slight. The author strongly urges a rectal examination in all cases of bleeding from the rectum, rather than the taking for granted that the condition is hæmorrhoidal.

The infiltration of the sphincters by the mass causes them to become weak and patulous; associated with this condition there is a "ballooning" of the rectum above the mass.

A patient in otherwise good health with a fair life expectancy, and having a growth, the limits of which are definable, is a suitable case for radical operation.

There are three operative procedures: perineal, Kraske's transsacral excision, and the combined abdominoperineal excision suggested by the author.

A complete radical excision is practically impossible by the first two methods; the perineal method has been abandoned. The absolute necessity for an efficient colostomy opening eliminates the second method. Following is a brief résumé of the technique of the abdominoperineal method:

A transverse colostomy by Maydl's method is first done. The abdomen is opened and the pelvic colon delivered and cut between ligatures. Both cut ends are divided. Both internal iliac arteries are tied and the mesosigmoid stripped from its lymphatics. The rectum is next stripped from the pelvis and bladder, dropped into the pelvis and the incision closed.

A circular incision is then made around the anus, continued back to the tip of the coccyx and the anus closed by a purse-string suture. The rectum and colon with their lymphatics are removed through this incision. The colon is opened at the end of forty-eight hours.

The operation is a severe one, the chief dangers being shock, hæmorrhage, and suppuration. The only places from which infection can occur are the cut ends of the colon and the site of the growth.

The author lays great emphasis on the site of the colostomy opening. He believes that the inguinal operation is much inferior to the transverse. There is less tendency to extravasation in the latter because there is not a perpendicular mass of fæces above the opening; for the same reason there is less tendency to prolapse of the mucosa. There is better access to the opening for cleansing, and there are no nearby bony prominences. The opening is farther from the site of the primary growth and better sphincteric action may be obtained.

The author makes his colostomy opening in the left hypochondrium much in the position of a gastrostomy. J. R. BUCHBINDER.

LIVER, PANCREAS, AND SPLEEN

Vaughan, G. T.: Three Cases of Recurrent Gall-Stones. *Am. J. Obst.*, N. Y., 1916, lxxiii, 155.

The author reports the following cases:

Case 1. A young woman had been operated on ten months previously, stones having been removed from both the gall-bladder and the common duct. Prompt recovery followed with relief of symptoms for several months, then the biliary colic returned. At a second operation the author found twenty small stones in the gall-bladder, evidently formed since the first operation. Cholecystectomy was performed with prompt recovery.

Case 2. A woman of middle age was operated on by the author. Three moderate-sized stones were removed from the gall-bladder and drainage of the gall-bladder established. Less than three months afterward she was again suffering with evident symptoms of gall-stones, and another surgeon removed the gall-bladder which contained a great many stones.

Case 3. A man about thirty-five years old was operated on by the author in December, 1913. Three stones were removed from the gall-bladder and drainage established. Recovery followed with relief of symptoms for five months then a return and persistence until the second operation in November when the gall-bladder containing one stone was removed. Recovery followed.

The author believes that re-formation of gall-stones is more common than is generally supposed. C. H. DAVIS.

Mayo, W. J.: Restoration of the Bile Passage After Serious Injury to the Common or Hepatic Duct. *Surg., Gynec., & Obst.*, 1916, xxii, 1.

Cholecystectomy has become the operation of choice for diseases of the gall-bladder. This operation has certain inherent dangers which must be very carefully avoided. In the Mayo clinic a number of cases are being met with in which, during the operation of cholecystectomy, the common or hepatic duct has been seriously injured, often severed, and sometimes a complete section removed, leaving a permanent obstruction.

This accident is brought about (1) because of anatomical peculiarities in which the cystic duct lies parallel with and adherent to the hepatic duct; (2) because the pelvis of the gall-bladder is not sufficiently dissected up so that the cystic duct is carefully exposed; (3) the cystic artery is not caught and, in attempts to catch it, the great duct is lacerated with heavy toothed forceps; (4) stones have caused ulceration which involved the common duct most often in the head of the pancreas which has later resulted in stricture; (5) or because of adenomafibroma formation of the stump of the cystic duct.

Operations for the restoration of the common bile duct are of a formidable character on account of difficult technique and the poor condition in which these patients usually come to operation. The Bevan incision is most appropriate.

The operations employed at the Mayo clinic have been: (1) resection of the obstructed portion of the duct with end-to-end union with the "T" tube which gives excellent results if the stricture be not over one-half to three-fifths inches in length; (2) in more extensive injuries of the duct, the hepatic duct should be united directly to the duodenum, using the Sullivan tube method as an adjunct; (3) direct union of the common duct to the duodenum, after the method of Coffey.

The results of these operations have been excel-

lent, quite contrary to a number of resections which have been done in this clinic for malignant disease in which both the immediate and ultimate results were poor.

Capelle: Implantation of the Common Bile Duct into the Upper Jejunum (Choledochuseinpflanzung in das obere Jejunum). *Deutsche med. Wchnschr.*, 1915, xli, 1442.

Capelle describes the case of a man admitted to the hospital for gall-stone colic, vomiting, and icterus; in the last three months he had lost 40 pounds. The diagnosis of gall-stones with intermittent occlusion of the common duct was not confirmed on operation; there were no stones found either in the gall-bladder or ducts; but the gall-bladder showed inflammatory contraction, the cystic duct was obliterated, and the common duct moderately dilated. The head of the pancreas was enclosed in a hard, nodular infiltration. It was impossible to determine macroscopically whether it was chronic pancreatitis or tumor. This infiltration of the pancreas seemed to be the cause of the interference with the discharge of the bile. As the gall-bladder was impassable and contained only a little colorless mucus, it seemed useless to do a cholecystenterostomy. It was feared that if choledochotomy was performed with external drainage there would be a permanent fistula, due to further contraction of the head of the pancreas and further obliteration of the common duct, but the severity of the condition demanded an operation of some kind for relief. As the common duct was long and strong enough and readily movable it was decided to implant it into the upper jejunum. The duct was ligated and cut close to the pancreas. An abundant discharge of bile from above showed that the upper part of the common duct was open. A loop of jejunum just below the plica duodenojejunalis was drawn forward and the cross-section of the common duct was implanted into it; it was sutured in several layers, the small intestine fixed into a slit in the mesocolon and cholecystectomy performed. All of the symptoms disappeared after the operation and the patient is now entirely well. This operation is indicated in cases of sclerosis of the head of the pancreas, either from inflammation or new-growth, in which cholecystenterostomy cannot be successfully done. A. Goss.

Boas, I.: Treatment of Cholelithiasis (Meine Erfahrungen ueber die Behandlung der Cholelithiasis). *Therap. d. Gegenw.*, 1915, lvi, 446.

There has been such an enormous increase in the number of cases of cholelithiasis since the beginning of the war that it may almost be called a war disease. This is due to the increased nervous strain due to war conditions. Married women are especially liable to gall-stone disease and they are now especially subjected to worry on account of the loss of their husbands and sons, the breaking up of their homes, the difficulty in obtaining food, and the neglect of their own health.

The treatment is primarily surgical, especially when the stone is lodged in the common duct. No medicinal treatment will discharge the stone, and operation should be early as the patient is subjected to the danger of cholæmia if there is any delay. Chronic cholecystitis calls for operation also, especially in patients who have not the time and money for long-continued spa treatment. Acute febrile cholecystitis or cholangitis offers a more favorable field for medical treatment, while at the same time the prognosis for operative treatment is not so good.

In acute attacks of gall-stone colic it is a great mistake to give morphine as it interferes with Nature's effort to discharge the stone. The pain may be relieved by hot compresses, etc., or if a sedative must be given only small doses of papaverine or codeine should be used. Perhaps the reason there are so few successful attacks of gall-stone colic is that morphine is so freely given. Boas believes that local blood-letting is of great value. He sacrifices the skin over the gall-bladder and applies Bier's hyperæmia cups. This is especially useful in cases where there is extreme pain and enlargement of the liver.

There are no medicines that will directly prevent the recurrence of attacks of cholelithiasis It is just as absurd to suppose that cholagogues will cause already existing stones to be discharged or prevent the formation of new ones as it is to suppose that gall-stones can be dissolved by chemical agents; but attention to diet and certain stomach conditions may aid in keeping the gall-stone trouble latent. Most gall-stone patients suffer from constipation, and an indication of prime importance is to keep the bowels regular. They also frequently have functional disorders of the stomach or ptosis of the stomach and intestines. Large amounts of food in the duodenum may obstruct the common bile-duct or facilitate the migration of bacteria into the bile passages. This assumption is confirmed by the fact that gall-stone attacks usually occur when the digestive tract is overloaded, and by the fact that they do not occur when there is stenosis of the pylorus and the food is discharged into the duodenum in very small quantities. Therefore meals should be light and taken at short intervals and heavy meals should especially be avoided at night. Spa treatment is of great value, not because of any specific effect of the waters, but rather on account of the associated rest, dieting, regular meals, baths, and outdoor exercise. The stay, however, should be much longer than is usually prescribed to be of any benefit.

In severe cases of acute cholecystitis Boas recommends the giving of calomel 0.1 gm. three times a day for at least four weeks. Russian physicians, who introduced this treatment, give as much as 0.5 gm. several times a day. The prognosis is much better where only the gall-bladder is affected than where the ducts are involved.

Recurrences after operation may be due to the

reformation of stones or to adhesions; but these recurrences are not nearly so severe as the original condition and generally yield to prolonged spa treatment. A. Goss.

Knox, J. H. M., Jr., Wahl, H. R., and Schmeisser, H. C.: Gaucher's Disease. *Bull. Johns Hopkins Hosp.*, 1916, xxvii, 1.

The authors present the cases of two infants, sisters, who did not thrive from birth and died, one at 11 months, the other at 15 months of age, from gradually increasing weakness. The most striking clinical feature was the great enlargement of the spleen and liver. The blood picture was that of a moderate anæmia. The leucocytes were rarely increased, and for the most part were markedly reduced in number. The skin in both cases had a peculiar yellowish-brown hue, more marked on the face and exposed surfaces. In one case the diagnosis was confirmed during life by the examination of an excised lymph-gland. Microscopically, in both cases nearly all the organs were found to contain large, pale, granular, or finely vacuolated cells, in which there was a peculiar refractive substance having the chemical and staining properties of lipoid material. These cells are apparently identical with those described by Gaucher and others in the condition called "Gaucher's disease."

The characteristic lesion in these two cases was the widely diffused accumulation and proliferation of the large, pale, granular, or finely vacuolated cells, most prominent in the lymphadenoid tissues, but apparently involving more or less extensively the reticular cells and the lymph-vascular endothelial cells, the process being generally associated with localized accumulations such as have been described in the medulla of both adrenal glands. The process was equally marked in the lymph-nodes as in the spleen and probably had begun simultaneously in both locations, other susceptible tissues being subsequently implicated. The large pale cell was also found in bronchi, arteries, veins, capillaries, glomerular tufts, scattered between renal tubules, in the mucous membrane of the stomach, in the capsules of various organs, in the pia, brain, and in large numbers in the bone-marrow. The occurrence of vacuoles in the parenchymal cells of most of the viscera—including the heart, pancreas, kidneys—thyroid, submaxillary salivary glands, in the Purkinje cells of the brain, in the nerve-cells of the anterior horn of the spinal cord, in the bipolar cells of the posterior root ganglion of the spinal cord, taken in conjunction with the negative results after the use of fat stains, indicates either a vacuolar degeneration or an accumulation of lipoid material in those cells as in the large pale cells, and suggests the presence of a very general pathological process, involving especially the lymphatic system.

George E. Beilby.

Pool, E. H.: Splenectomy for Von Jaksch's Anæmia. *Ann. Surg.*, Phila., 1916, lxiii, 122.

Pool reports a case of von Jaksch's anæmia in a child of eighteen months on whom he had performed a splenectomy, with good results. The examination prior to operation may be summarized as follows: marked anæmia, rickets, and an enlarged spleen. The blood examination was as follows: negative Wassermann; red count 2,700,000; hæmoglobin 45 per cent; white cells 12,000; polynuclears 47 per cent; normoblasts and megaloblasts were present. A spleen weighing 230 grams, showing a high grade meloidization, was removed May 11, 1915. Three weeks after the operation the red blood count had risen to 4,500,000 and the hæmoglobin to 60. Isidore Cohn.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Worms, G., and Hamant, A.: Study of Coxa Valga (Etude sur la coxa valga). *Rev. de chir.*, 1915, Nov.

The following classification of this condition is given:

1. Congenital coxa valga, either isolated or combined with dislocation or subluxation of the femur.
2. Traumatic coxa valga.
3. Rachitic coxa valga.
4. Static and functional coxa valga.
5. The coxa valga of adolescence or idiopathic coxa valga.

Among the etiological factors which are at work in congenital forms, abnormal conditions of the uterus are mentioned. A number of years ago Friedlander of Vienna referred to external causes, as, oligoamnios, hypertrophy of the liver, pressure of the uterine wall, as conditions responsible for the occurrence of coxa valga as well as for the congenital dislocations of the hip. The association of these two conditions has been pointed out by a great number of observers, and although their views differ materially as to the frequency of this relation, it may be said without exaggeration, that at least two per cent of all cases of congenital dislocation of the hip show a coxa valga deformity. The subluxation is an intermediate stage between the normal and the dislocated hip. Ogston and Klapp were the first to call attention to the concurrence of these two conditions. They are not interdependent on each other, but rather represent two distinct pathological conditions.

In rickets coxa valga has been observed not infrequently. It is very often a compensatory deformity associated with curvature of the shaft of

the femur. In rare instances coxa valga has been observed in osteomalacia, and in tuberculosis of the hip.

There are unquestionably instances of a merely traumatic form of coxa valga, although it requires a special mechanism of the trauma to produce this deformity, as Drehmann has pointed out. In regard to treatment the plaster of Paris fixation has given most satisfactory results. A number of cases require subtrochanteric osteotomy. The author reports a series of cases from his own experience and from the literature. A. STEINDLER.

Faber, H. K.: Experimental Arthritis in the Rabbit; a Contribution to the Pathogeny of Arthritis in Rheumatic Fever. *J. Exp. Med.*, 1915, xxii, 615.

The author reviews the literature and cites a carefully worked out and reported series of experiments on rabbits in the production of arthritis by the injection of various bacterial strains, three of streptococcus viridans and two of pneumococcus and one of bacillus typhosus. None of them were virulent strains and none caused arthritis on less than three injections. A successful attempt was made to sensitize joints both by successive intravenous injections and by preparatory intra-articular injection of dead and living bacteria. The article is an intensely interesting and suggestive one.

The author summarizes as follows:

1. By a process of sensitization it was found possible to cause arthritis in rabbits constantly after one intravenous injection of an organism which otherwise required three or more injections. This reaction is specific.

2. An analogy is suggested between arthritis by sensitization, and the relapses in human rheumatic fever. A further analogy is suggested between the development in rabbits of arthritis after repeated intravenous injections and the development of the primary lesion in rheumatic fever.

3. No one organism is responsible but evidence tends to show that various streptococci, especially of the viridans group, are most efficient.

F. C. KIDNER.

Nutt, J. J.: The Treatment of Tuberculous Arthritis. *Am. J. Orth. Surg.*, 1916, xiv, 1.

If the patient is a child and comes under treatment early, and only one joint is involved, and perfect control of the case is had, recovery with good functional movement and with little or no deformity may be expected, except in infection of the upper spine where it seems impossible to avoid deformity.

Where deformity is already marked and destruction of bone is already present, the prognosis is an ankylosed joint with some deformity.

The most essential thing in the treatment of a tuberculous joint in a child is to attend to the general condition of the patient. Respiration, circulation, digestion, excretion, exercise, and mentality are each to receive consideration.

It is necessary for the patient to be outdoors twenty-four hours a day. A sparsely settled neighborhood is desirable and the country is preferable to the sea shore. The diet should be a mixed one, unless there are specific reasons to the contrary. The appetite should be stimulated by personal attention. The bowels should move well, daily. The total quantity of urine should be kept up to normal. The skin must be kept active. The patient must be kept in a cheerful state. Exercise is good if local conditions will permit it.

When bed treatment is necessary he prefers to keep the child in bed with a well adjusted brace rather than a frame.

Under no circumstances should great force be used to correct a deformity. He finds Bier's treatment to be of very little value.

After eighteen months of thorough trial he finds tuberculin to be of no other use than that of a good general tonic. Heliotherapy has no specific action. He has discarded Beck's paste. He is inclined to believe that bone-grafting is indicated, especially for adults. PHILIP LEWIN.

Varay, F.: Gunshot Injuries of the Joints at the Front (Plaies des articulations par projectiles de guerre dans une ambulance immobilisée de l'avant). *Lyon chir.*, 1915, xii, 654.

The diagnosis of medium and large sized injuries of the joints is only a question of inspection; but it is difficult in bullet wounds with punctiform openings and in wounds with no exit when the projectile has not been located. These doubtful cases should never be explored at the sorting ambulance but should be sent directly to the surgical ambulances where the diagnosis may be made by X-rays.

The seriousness of a joint injury depends on whether or not the joint is infected; so the aim of treatment is to prevent infection. In small punctiform wounds the joint should be immobilized and watched carefully; arthrotomy should not be performed at once even if puncture gives an effusion which shows a positive culture. If there is no local reaction and the temperature is not above 38° the infection can be overcome. On the slightest clinical signs the joint should be drained, but all larger wounds ought to be drained without delay.

Two cases are described that came in together illustrating the importance of immediate arthrotomy. Both had injuries of the knee-joint, the first apparently much more serious than the second. In the first case arthrotomy was done; the fever disappeared by the third day; recovery was uneventful and the patient was discharged in excellent condition the twenty-ninth day. In the second case the knee injury was slight and showed no inflammatory reaction, so it was decided to wait. At the end of twenty-eight hours the joint had become painful and the temperature had risen to 39.3°. Arthrotomy was then performed but the infection had become so serious that the temperature was not normal until the twenty-second day and the man was

still in a serious condition when he passed out of the author's service.

To be most effective arthrotomy should be prompt. Its object is to prevent, not to cure infection. It should also be extensive; it fails sometimes from being too timidly performed.

If free arthrotomy is performed a good view can be obtained of the joint lesions, and if they are serious enough to demand it resection should be performed at once. The resection should be atypical; in every case only so much as is necessary of the bone should be removed. In very severe injuries, veritable explosions of the joint, total resection may be indicated. Rarely, however, is it necessary for resection to be performed at once, and still more rarely is immediate amputation necessary. But it is of great importance that the surgeon should be able to recognize the cases in which it is necessary, for primary amputation gives a much lower mortality than secondary amputation. Expectant treatment, arthrotomy, simple or complicated resection and amputation are the various degrees of operative intervention; but the important thing is to know which to adopt in order to precede and not follow the course of the infection. A. Goss.

Roux: Treatment of Gunshot Injuries of Joints (Ueber die Behandlung der Gelenkschussverletzungen). *Deutsche med. Wchnschr.*, 1915, xli, 1474.

Roux points out that the frequency of grenade and shrapnel injuries in this war make a more active treatment desirable than in former wars, though very small wounds may recover under the old conservative methods. In the treatment of injuries of the joints he has come to the conclusion that resection gives better conditions for drainage than simple arthrotomy and shortens the period of hospital treatment. Almost all bullet wounds and some small grenade wounds are not primarily infected; but even cases with abundant purulent exudates may recover with very good function. Complete immobilization produces quite remarkable results in many cases, particularly in the knee-joint and in the so-called intermediary stage. But when a joint wound shows severe infection for a few days, or where there is a great deal of crushing at first, there should be arthrotomy, supplemented by removal of the cartilaginous surfaces. Often great harm is done in joint injuries by using too conservative treatment; the surgeon does not perform arthrotomy because puncture seems to be giving good results; then he hesitates to perform resection because it is a severe operation and is followed by ankylosis, and so the patient has to undergo all these procedures successively, but each one is a little too late, and he finally succumbs to the infection. A. Goss.

Beekman, F.: Giant-Cell Tumors of the Tendon Sheaths. *Ann. Surg.*, Phila., 1915, lxii, 738.

Three cases are reported, in the first, a girl 12 years old had noticed a growth for four months at the base of the index-finger on the flexor surface. There was no pain, no increase in size, and no history of injury. A vertical incision 1 inch long was made and the small round tumor popped out from inside the tendon sheath, being attached only by a threadlike pedicle. On section it was found to be cartilaginous, the surface being of uniform smoothness.

The second case was that of a man 46 years old, who had a swelling on his foot for three years, but experienced no discomfort except from rubbing of the shoes. Three months before seeking advice a second lump appeared close to the first. They were at the base of the first and second metatarsals on the dorsum of the foot. They were easily excised and proved to be a bilobular tumor, one tendon passing over, the other under it. He died two years later of recurrent tuberculosis.

The third case, a woman of 36, had a small swelling on the dorsal surface of the distal phalanx of the index-finger, which had grown slowly for eighteen months until it was the size of a pea. It was easily enucleated through a small incision. In each case microscopical examination showed cells resembling those in endothelioma with places of fusion leading to the formation of indefinite giant cells. In no instance was there recurrence. Giant-cell tumors are not rare, but little has been written about them in the English literature. The French and Germans have written considerable, classifying them as giant-cell sarcomata and myeloid endotheliomata. Little is said of these growths in textbooks, but over half of the tendon sheath sarcomata are of the giant-cell variety. They occur more frequently in men, and in the second, third, and fourth decades, though they do appear later. The greatest number are seen between the ages of 20 and 40 on the hands and feet, more often the former, 66 per cent on the right hand, 80 per cent on the flexor surfaces. Those found on the foot are usually in the peroneal tendons near the external malleolus. Trauma is said to be a cause, but this is disputed; none of the three reported cases gave such a history. Examination shows a hard, smooth, round or lobulated, painless swelling not fastened to the skin, and though sometimes attached to the tendons, rarely interferes with their movement. The size and shape of course vary with the position, but they are never very large. The color is dark reddish-brown to light yellow. The histological picture resembles a giant-cell epulis more than any other giant-cell tumor, but it does not develop from periosteum. Also like the epulis it does not metastasize or recur on removal. Some writers classify these growths as sarcomata, others as myelomata, still others as granulomata. Mallory says the giant cells in this type of growth are only foreign body cells and the tumor should be named from the character of the cells in the stroma. Beekman says none of these men have proved the inflammatory origin of these growths, nor does he think the giant cells resemble in any way those due to chronic irritation. He also says that though the microscopic appearance is that

of cellular connective-tissue neoplasms, their behavior is that of a simple benign growth. The author concludes that the best name is "giant-cell sarcoid tumors of the tendon sheaths."

C. A. STONE.

Schloessmann: Open Dry Treatment of Gas Infection, Especially Gas Gangrene (Ueber die offene, austrockende Wundbehandlung bei Gasinfektion, insbesondere bei Gasgangraen). *Muenchen. med. Wchnschr.*, 1915, lxii, 1653.

Free incision is generally sufficient in superficial gas phlegmon, but in advanced cases of gas gangrene it is not. Amputation is often necessary, but sometimes even this is impossible when the gangrene is on the trunk or just at the root of the limb, so that it cannot be completely removed. The infecting bacteria are in the deep tissues and the dead muscles lie above them in a thick layer of soft tissue, effectually shutting out air and producing the best conditions for their development. The soggy muscle tissue closes in on drains and tampons so that they become ineffective almost immediately. In such cases Schloessmann advises opening up the wound thoroughly, his method being as follows:

The skin is incised and dissected back over the whole gangrenous area, the points of the flaps being sutured to the sound skin. The œdema indicates the place to which the dissection must be carried. Then the dead muscles tissue is opened up with the finger, it being not necessary or desirable to use a knife. It is very easy to distinguish between the dead and normal muscle, and no matter how large a mass of muscle is necrotic it should be removed up to the edge of the sound tissue. It is astonishing how large a mass of muscle can be removed without producing any serious functional disturbance. The wound is then left open to the air, a wire screen being placed over it to prevent the bed clothes from touching it. The free access of air destroys the anaerobic bacteria and the moist gangrene is quickly converted into a dry necrosis. The temperature falls quickly and the pulse improves in quality. Even if large vessels are laid bare no harm is done.

A case is described in which the gangrene was in the region of Scarpa's triangle and the femoral vessels were exposed. The circulation was undisturbed, and as the wounds healed they became covered over with muscle again. While Schloessmann does not think that dressings should be abandoned in all wound treatment he feels that open treatment is unconditionally indicated in these severe cases of gas gangrene.

A. GOSS.

Dupeyrac: Treatment of Diabetic Gangrene with Hot Air (Traitment de la gangrène diabétique par l'air chaud). *Rev. de chir.*, 1915, xxxiv, 408.

Dupeyrac presented to the Surgical Society of Marseilles the foot of a patient who had had diabetic gangrene; it had been mummified by hot air at about 700°. The gangrene had been pursued with this treatment to the middle of the calf. The septic phenomenon had yielded rapidly; the temperature fell from 39.5 to 37°; but after a line of demarcation had been formed the patient died of pulmonary œdema and myocarditis. He pointed out that with this treatment it is possible to dry up the gangrene and render it aseptic, and after the dangers of septic infection are removed the amputation may be done.

ROUX DE BRIGNOLES reported two cases of diabetic gangrene treated with hot air. The first patient is still under treatment. The second was a woman who was sent to him for leg amputation. Her general condition was bad; her temperature was 40° and the sugar varied from 7 to 45 gm. to the liter of urine. The foot was œdematous and all the leg was infiltrated. Under the hot-air treatment the condition subsided and it was only necessary to amputate two toes.

IMBERT thinks that the introduction of the hot-air treatment has introduced a new era into the treatment of gangrene. Its action extends to a great enough depth to bring about a real and useful sterilization of the tissues. He thinks that operation should not be early, but that one should wait till there is a very clear line of demarcation to avoid sacrificing too much. With the hot-air treatment it is possible to wait, but there are two indications for operation: marked sign of infection and intense pain. With reference to the last indication he reported the case of a woman who had intense pain and he was about to amputate the whole foot. As a result of reading an article by Morestin he did a nerve-section, which not only stopped the pain but arrested the progress of the gangrene.

A. GOSS.

FRACTURES AND DISLOCATIONS

Grossman, J.: Fractures of the Elbow. *Med. Rec.*, 1916, lxxxix, 93.

This paper is based on the study of fifty cases of fracture of the elbow, which were treated by the acute flexion position. The author advises that every case of injury to the elbow when the diagnosis is doubtful, should be placed in the acute flexion position until the diagnosis is cleared up by the X-ray (except fractures of the olecranon process). Passive movements and massage are begun about the tenth day and continued until the movements of the joint are normal and free from pain. Many of the cases are reported in detail. The article is illustrated with photographs and radiographs.

A. J. DAVIDSON.

Greenough, R. B., Osgood, R. B., and Vincent, B.: Gunshot Fractures of the Extremities. *Boston M. & S. J.*, 1916, clxxiv, 37.

The author's report is based upon a series of 148 fractures in 132 patients seen in the Harvard University Service at the American Ambulance at Neuilly-sur-Seine, France, from April 1, 1915, to July 1, 1915. There were 129 compound fractures

8 of which were incomplete, and 19 closed or simple fractures. Irregular comminuted fractures were the rule. Only 3 of 121 compound fractures healed by first intention. This was attributed to contamination of the wound by clothing, dirt, etc., at the time of injury.

The average case reached the American Ambulance on the third or fourth day, having had iodine and a first-aid dressing applied at the front. Practically every case received tetanus antitoxin, and was immobilized in tin or aluminum splints for the journey to the base.

The routine treatment consisted of anæsthesia, enlargement of the wounds of entrance and exit, removal of foreign material, and detached bone fragments, irrigation with sodium hypochlorite (1:200), drainage with rubber tissue, and fixation in extension. Metal splints were occasionally used, but plaster dressing reinforced with bridges of steel or wire gauze with a window cut for dressing was the common method of fixation.

Excluding injuries of the fingers there were six amputations performed in the Harvard University Service, as follows: for secondary hæmorrhage, 2 cases; for sepsis of the knee or ankle-joints, 3 cases; for gangrene and gas bacillus infection, 1 case —this case died, the one fatal case.

The most important complications were sepsis, secondary hæmorrhage, necrosis and delayed union, and complicating nerve lesions.

A certain number of cases required orthopedic treatment and apparatus for the prevention or correction of ankylosis and contractures.

Of the 16 closed fractures, 5 were operated upon and fixed by the open method with plates or bands.

The conclusions drawn from these cases are as follows:

Early and thorough operative treatment is indicated in gunshot fractures received under the condition of trench warfare.

The removal of missiles, foreign bodies, and detached bone fragments, and thorough drainage are important.

Complete immobilization in extension is as a rule best obtained in a base hospital by plaster dressings put on under anæsthetic.

Frequent and painstaking dressings, with or without irrigation, and the maintenance of free drainage are of great importance in overcoming sepsis.

Prophylaxis is better than corrective treatment in the avoidance of ankylosis of joints and contractures of muscles and tendons.

Solomon, E. P.: Potential Factors in Fracture Surgery of the Shafts of Long Bones. *Internat. J. Surg.*, 1916, xxviii, 405.

The author reviews the writings of many surgeons as to their care of fractures of long bones, and presents what in his opinion is the best line of treatment in these cases.

He believes that the treatment of fractures of the long bones should not always be operative, nor always non-operative, his aim constantly being to get the best functional results. His rule in the treatment of any fracture is to skiagraph before and after reduction, the reduction being accomplished under an anæsthetic. If the deformity cannot be reduced from an anatomical standpoint, he believes it is a case for open operation.

He outlines his treatment for various fractures of long bones, sometimes using open operations, again splint and traction, and plaster of Paris dressing, and seems to have no fast or fixed rule. He favors the use of the Lane plate in many of his cases.

C. C. CHATTERTON.

Baudet, R.: Fracture of the Astragalus (Contribution à l'étude des fractures de l'astragale). *Rev. de chir.*, 1915, xxxiv, 305.

Baudet reviews the literature of the subject. Up until the introduction of radiography fracture of the astragalus was seldom correctly diagnosed and treatment improperly applied led to very bad functional results. In an injury of the foot from falling on the foot with a pronounced varus position and when the pain can be localized over the neck of the astragalus a fracture of this bone should be suspected, and should be confirmed by radiography. The prognosis as to function is much better in recent years than formerly. The treatment may be simple reduction, operative reduction, operative reposition, or astragalectomy. Simple reduction with immobilization in a plaster cast should be accomplished by the aid of radiography and should be followed by massage and mobilization. The treatment must be long-continued to get good functional results. This treatment is indicated in simple fractures of the neck with only slight displacement.

The functional results of simple reduction are not very good in fracture of the body. If simple reduction fails or if the fracture is compound, operative reduction is indicated. In the great majority of cases, however, total astragalectomy is indicated, particularly in cases of fracture of the body with luxation of the posterior fragment, fracture of the body with displacement that cannot be reduced simply or by operation, and in all cases of infected fracture. Partial anterior astragalectomy and partial posterior astragalectomy have given good results in a few cases but they do not correct the wrong position of the fragment that is left in place. In anterior astragalectomy sufficient support is not offered to the tibia when the foot is extended on the leg. In posterior astragalectomy the head and neck form a wedge when the foot is flexed on the leg, so that total astragalectomy is to be preferred to these partial operations. Baudet is not so radical, however, in advising astragalectomy as the older authors, because the experience of recent years has shown that many cases can be successfully treated by the more conservative methods of simple or operative reduction. A. Goss.

Delbet, P.: Method of Treating Fractures (Méthode de traitement des fractures). *Rev. de chir.*, 1915, xxxiv, 249.

The essential feature of Delbet's method of treating fractures is a metal extension apparatus which is applied at once, after which the patient is allowed to get up and walk. By means of a hollow metal rod into which a solid one glides, like a curtain rod, provided with a spiral spring, extension is accomplished. There are holes half a centimeter from each other, and by driving pegs into them the apparatus can be made rigid at any desired length. The points of support are metal or plaster rings passed around the upper and lower extremities of the fractured bone, leaving the joints free. The details of the application of the apparatus to the different bones are described.

Delbet holds that the object of fracture treatment is not only reduction and mobilization but early restoration of function. This is not accomplished by any of the older methods of fracture treatment. It is impossible to reduce a bone by manual traction. Traction must be steady and regular to overcome the resistance of the contracted muscles. Manual traction is jerky and irregular, and between the jerks the contracture of the muscles is increased. The steady continuous traction exerted by his apparatus obviates this difficulty and corrects the shortening. It does not bring about a perfect coaptation of the fragments, but this is not necessary to perfect function, as has been shown beyond doubt by radiographs of perfectly functioning limbs. Plaster troughs prevented secondary displacement of the bones, but only if they were extended beyond both the adjacent joints. This caused stiffness of the joints and tendon sheaths and atrophy of both muscles and bone from disuse. The bones did not decrease in size but they became decalcified. This was shown in the roentgen pictures, in which the shadow of the fractured bone was much more transparent than that of the uninjured limb. The callus was often quite transparent, so that patients sometimes refused to walk on the leg because they did not believe the bone was consolidated when they saw the clear space between its ends. The transparency of the callus was due to the poor nutrition of the limb. For all these reasons it took the patient a long time and much after-treatment to recover, not from the fracture, but from the treatment he had been given for it.

Fixation by means of plates, such as those of Lane and Lambotte, had much vogue for awhile, for there was no doubt that it secured perfect anatomical results, but this does not necessarily mean perfect functional ones. Moreover, it is necessary to immobilize after-fixation with plates, and sometimes for a longer period than in fractures not treated by operation. So this method involves all the disadvantages of plaster immobilization. The method of nail extension overcomes this objection, but the bones do not always bear the nails well, and there is danger of infection. This method should be reserved for cases where no other is effective.

Championnière advocated massage and mobilization in the treatment of fracture, but he went too far and deformities resulted that were hardly justifiable. Delbet advocates the immediate use of the limb, but insists on the importance of an apparatus which holds it in place without interfering with function. It has been shown by animal experiments that use of the limb hastens, rather than retards, consolidation. He points out that when patients with his apparatus walk they are really using their muscles and joints, not merely passively supporting themselves with the apparatus. It is important that the apparatus he applied at once, for the work of repair begins very quickly and any delay causes the loss of this early repair, while a late reduction constitutes a fresh traumatism.

A. Goss.

Moore, J. E.: Operative Treatment of Bad Results After Fracture. *J.-Lancet*, 1916, xxxvi, 4.

The author considers that two great misfortunes may follow a fracture: non-union and deformity accompanied by disability. Various methods of correction for many of the deformities are discussed and cases cited that have been operated upon by the author and his associates, among which are osteotomy of deformity after Pott's fracture; nailing for fracture of the neck of the femur; nailing for elbow fracture; and bone-grafting for non-union.

The author believes that in every case of fracture of the elbow-joint, and in every case of Pott's fracture when reduction cannot be accomplished by manipulation, operation should be resorted to before new bone has commenced to form.

A. J. Davidson.

Bebee, E. L.: Dislocation of the Semilunar Bone. *N. Y. M. J.*, 1915, cii, 1186.

Since the advent of the X-ray, this peculiar dislocation has been diagnosed more frequently. Its importance rests on the difficulty of diagnosis, and permanent deformity with uselessness, pain, and stiffness resulting providing no treatment is adopted.

The dislocation is usually due to direct or indirect trauma. The direct causes are such as force applied to the back of the wrist, as blows from stones and implements. The indirect cause may be falling on the extended hand or when the elbow is fixed and force is made on the hand. On account of the anatomical position of the semilunar bone this lesion is very prone to occur.

The symptoms are pain, uselessness of the hand, deformity which varies with the stage of imflammation, more or less stiffness of the wrist, flexion of the fingers, and prominence on the front and a depression on the back of the wrist. Pronation and supination are not interfered with. The X-ray is necessary for diagnosis.

If the accident has occurred some weeks or months previous, the same symptoms will be present except

that the acute imflammatory condition will be absent. The treatment of a dislocated semilunar bone if recent and no complication be present consists in reduction by manipulation, the method being traction in hyperextension with pressure on the displaced bone, after which the hand is placed in flexion and pressure maintained over the semilunar bone. If the dislocation is compound or if manual reduction is impossible, excision is necessary.

If the dislocation has existed one or two months open reduction has been recommended, but the results from excision have proved most satisfactory, in that the patient regains good use of the part, except for slight limitation in adduction, abduction, and hyperextension. Pain disappears from the wrist permanently. J. H. SHAW.

Ransohoff, J.: Dislocation of the Knee. *Lancet-Clin.*, 1916, cxv, 69.

Ransohoff adds three cases of dislocation of the knee-joint to the rather meager reports recorded in the literature.

The latest German tabulations show that in a little over 40 per cent of all cases of dislocation of the knee, the leg is dislocated forward; in about 20 per cent backward; in 20 per cent outward; and in about 7 per cent inward.

The author contends that practically all dislocations of the knee, unless attended by extensive fracture, are primarily either forward or backward. The lateral displacements and rotation of the leg which are occasionally encountered, he believes to be the result of a continuation of the force on the leg already dislocated. Anterior dislocations almost always occur while the limb is in extreme extension, and posterior dislocations while it is in flexion.

It is impossible to conceive of an anterior or posterior dislocation of the knee without the tearing off of one or both crucial ligaments; however, complete recovery of joint function in these cases is in marked contrast with the slow recovery which often attends seemingly less severe injuries of the knee-joint.

The most serious danger encountered is from damage to the blood-vessels in the popliteal space. In many instances the artery or the vein or both are torn, necessitating either primary suture or amputation. Laceration of the capsule and ligaments is usually so extensive in this injury that with little traction and manipulation reduction is readily accomplished. R. B. COFIELD.

SURGERY OF THE BONES, JOINTS, ETC.

Koerte, W.: Importance of Immobilization in the Treatment of Gunshot Wounds of Bones and Joints (Ueber die Wichtigkeit feststellender Verbaende bei der Behandlung von Knochen- und Gelenkschusswunden). *Berl. klin. Wchnschr.*, 1916, liii, 1.

In civil surgery during the past few years there has been a marked tendency to substitute extension treatment or massage and early movement for immobilizing dressings in fractures. This has been in vogue to such an extent that recent medical graduates do not even know how to apply a plaster cast well, but have to learn after going to the front. Even in effusions of blood into the joint, massage and early movement is practiced rather than immobilization of the joint. Even though this may be justified in civil practice, Koerte points out that immobilization is absolutely essential in injuries of the bones and joints in war. In the majority of cases the patients have to be transported before consolidation takes place, which not only causes them great pain, but increases the danger of infection by irritating the tissues with the bone fragments and reawakening latent bacteria. The more complete the immobilization the better the transportation is borne.

At the dressing station there is not time to apply casts, so splints must be used. Splints have been made of all sorts of material but wooden splints 2 to 3 mm. thick are best. Of the metal splints Cramer's wire splints are the best. These will do until the field hospital is reached when a cast should be put on, with openings for the dressing of the wound. The patient should be given 1.5 to 2 cg. morphine while the cast is being put on, and if he is in great pain or if it is necessary to incise and cleanse the wound, light ether anæsthesia is used. The stiffening of the joint, which is the chief objection urged against the plaster cast, can be very much limited by placing the leg in a slightly flexed position. The joint should also be moved every time the dressing is changed. As soon as the ends of the bone are united the plaster should be removed and exercises given the joints and muscles. The author has seen many cases that were doing badly under extension treatment and after the application of casts the suppuration subsided and consolidation progressed rapidly. A. GOSS.

Koerte, W.: Treatment of Infected Gunshot Injuries of Bones and Joints (Zur Behandlung der inficierten Knochenund Gelenkschuesse). *Berl. klin. Wchnschr.*, 1916, liii, 30.

Infection is much more frequent in gunshot wounds than it was during the first month or two of the war. Some of the causes of this are beyond control. Infection is favored by the fact that the patients often have to lie on the damp ground for some time before their wounds are attended to at all; at the dressing station they often have to be laid on straw, which is dusty. Special care is necessary to prevent the wounds being soiled with dust. A third important factor, which is preventable, is that the limbs are often not sufficiently immobilized at the dressing station. Every movement of the ends of the bones increases the effusion of blood and wound fluid, and therefore the danger of infection. It is of great importance that patients with such wounds should not be transported until the bone is completely healed; but at the eastern

front this is almost impossible to carry out. The hospitals at the front do not have room to keep all the wounded so long, and cities with adequate hospital facilities are very few and at great distances from one another. Conditions are much better on the western front.

At the first sign of infection the wound should be opened up along its entire length, due consideration being given of course to anatomical structure. Drainage tubes should be introduced through counterincisions at the most dependent points. No pressure should be exerted to press out the wound secretion, as this only spreads the infection. This treatment should be given at the dressing station under light anæsthesia. For the first few days the wounds should be dressed daily. Chemical antiseptics irritate the tissues and do no good. In the stage of healing calcium chloride powder and balsam of Peru aid in the formation of granulations. Very large wounds with much suppuration should be left entirely open, the limb being covered with a wire net with gauze spread over it to keep out the dust. Bier's hyperæmia is recommended. The author has had no personal experience with it, but thinks it of value only in the beginning and only in hospitals where there are plenty of physicians and nurses; no such ideal conditions exist at the eastern front.

As a matter of fact the best part of the treatment is the prevention of infection, to which the utmost care and energy should be directed. A. Goss.

Jaeger, C. H.: Flexion Deformity of the Knee; an Improved Method of Correction. *Am. J. Surg.*, 1916, xxx, 15.

The author describes his method and apparatus of correction of flexion deformity of the knee. The apparatus is really a home-made Goldthwait genuclast, consisting of plaster-of-Paris cuffs, steel bars, and long wooden handles. The minute detail of the apparatus does not lend itself easily to abstract form, and the reader should refer to the original article.

The method of correction is the ideal one, in that it prevents the subluxation of the tibia and fibula, and in this way may have some advantage over the Goldthwait genuclast. C. C. Chatterton.

Cook, A. G.: Operation for Relapsed Club-Foot. *Am. J. Orth. Surg.*, 1916, xiv, 9.

The author describes his operation of tarsectomy for cases of relapsed club-foot that have resisted the ordinary methods of treatment. There is no age limit, no preliminary treatment, and no after-treatment beyond the time required for the healing of the wound. The steps in the operation are as follows:

1. If necessary subcutaneously divide the fascia on the inner side of the foot and the tendo achilles, then bring the foot into as good position as possible using nothing but the hands and being careful not to bruise the tissues.

2. Make an incision through the skin and superficial fascia just in front of the external malleolus on the outer side of the foot. The skin incision should be perpendicular from the bottom of the foot to just above the bend of the ankle.

3. With an osteotome remove a large wedge of bone; make the first incision far back, just in front of the fibula. Pay no attention to the periosteum or peroneal tendons. Cut the bones completely across and remove everything.

The foot can then be brought without force into excellent position and by giving the anterior part of the foot a quarter turn its outer border can be elevated. Cook uses a light retention splint in preference to a plaster cast. He often allows young children to walk after two weeks. The dressing is worn from six to eight weeks when an ordinary shoe is fitted.

He has operated upon 30 patients during the past twenty years. Three feet relapsed, requiring secondary operation, probably because too small a wedge of bone was removed. One foot relapsed because the anterior portion of the foot was not sufficiently rotated and a sharp point of bone projected toward the sole of the foot. In one foot he removed too large a wedge of bone and the patient had a moderately pronated and flat foot. Philip Lewin.

Gallie, W. E.: Tendon Fixation in Infantile Paralysis. *Am. J. Orth. Surg.*, 1916, xiv, 18.

In brief, the author's method consists in exposing and isolating the tendon, drawing it taut so as to correct the existing deformity and burying it in the bone in such a way that when healing takes place, the deformity cannot recur.

In cases of varus deformity the technique is as follows: A tourniquet is applied and a vertical incision is made over the external malleolus, about 2.5 inches in length, exposing the bone and the peroneal tendons. The tendons are carefully freed from their sheaths and are either split into several strands by longitudinal incisions or are scarified on their surfaces by numerous small transverse cuts. A longitudinal incision is then made through the periosteum on the outer aspect of the malleolus and shaft of the fibula, extending down past the epiphyseal cartilage to the tip of the bone. The periosteum is raised for about three-sixteenths inch on either side of this incision, and if the epiphysis consists of cartilage, a flake of cartilage is raised with a knife to correspond with the reflected periosteum. With a gouge of suitable size and shape a trough is then cut in the bone, the full length of the incision, and of sufficient depth to completely bury one of the tendons. A similar trough is prepared on the posterior surface of the malleolus subjacent to the groove normally occupied by the tendon. The foot is then held in an overcorrected position by an assistant. With the aid of a pair of Kocher clamps the tendon of the peroneus longus is drawn taut and laid in the anterior groove. At the lower end of the incision a medium-sized kangaroo suture is passed

twice through the tendon and cartilage of the epiphysis on either side and when this suture is tied it acts as a very effective anchoring stitch. The periosteum is finally sutured over the buried tendon with catgut. This procedure is repeated in the case of the peroneus brevis. The incision is closed with catgut and horsehair and a plaster-of-Paris bandage applied over the dressings to hold the foot in the correct position. The plaster remains on from six to eight weeks.

In some cases where simple manipulation failed to obtain correction, in addition to the tendon fixation, arthrodesis was performed, sufficient bone being removed from the astragalonavicular and calcaneocuboid joints to allow of easy correction of the varus.

In some cases in which equinus is present as the result of paralysis of the dorsiflexors of the foot in addition to paralysis of the peronei, the peroneal fixation should be combined with a fixation of the tibialis anticus tendon.

It is important that the tendons should be completely freed from the annular ligaments of the foot so that the tendon joins the point of insertion with the point of fixation in a straight line.

In cases of paralytic calcaneus the technique is similar except that the Achilles tendon is buried in the posterior surface of the tibia. After solid union has occurred a moderate lift is put on the heel of the shoe. When paralysis of the tibialis posticus is present in addition to paralysis of the triceps surae, the tendon of the tibialis posticus is drawn taut and buried in a groove in the internal malleolus.

In cases where there has been a partial recovery of the paralyzed muscles he performs fixation of half the tendon.

The author claims for his method, superiority over arthrodesis, because it eliminates motion only in the direction of the deformity; over tendon transplantation because of a much broader applicability and of much more certain success; over silk ligament installation because it is more direct and efficient.

He reports 150 operations by this method, all of which healed by primary union and, with the exception of 10 cases, the results were all that could be hoped for. Of the permanence of the results it is impossible to say more at present but the degree of benefit derived by the patient and the fact that the immediate improvement has stood the test of three years remove any hesitation on his part in recommending this form of treatment.

PHILIP LEWIN.

Leriche, R.: Resection for Injuries of the Elbow in War (De la résection dans les plaies articulaires du coude par projectiles de guerre). *J. de chir.*, 1915, xiii, 350.

Leriche believes that all gunshot injuries of the elbow should be treated by resection. It permits open dressing of the lesions, prevents infection or overcomes it if already established, and if followed up by correct after-treatment it insures almost normal mobility of the joint. Nearly always wounds of the elbow-joint, even if they appear slight, are infected, and if given the so-called conservative treatment the patient is apt to undergo a long period of suppuration, ending finally in ankylosis. Primary resection is safer and in the long run more conservative.

Two directly opposite objections have been urged against resection, one that it is apt to be followed by ankylosis, the other that it results in flail-joint. When either of these conditions arises after resection it is due to defective after-treatment.

The details of the after-treatment are discussed, attention being called to the fact that massage and movements may be overzealous as well as lacking in the other direction. Cases are cited in which movements were kept up in spite of pain, resulting in inflammation and partial reankylosis.

The author has performed nine primary resections and has followed the cases for several months. There was not a single case of either reankylosis or flail-joint. Part of his success he attributes to the fact that he practices subperiosteal denudation of the muscles, thus preserving their normal attachments. The function of the new joint depends on the condition of the muscles. The classical method of resection should be followed, no matter where the entrance and exit wounds may be. The results are much superior to those of partial resections. The wound should not be sutured at all; but the arm should be dressed at an acute angle and placed in a wire trough. The plaster becomes softened with the discharge so that it does not immobilize sufficiently. If possible the first dressing should be left on for three days. From the fourth or fifth day the wound should be exposed to the sun without any covering.

The results of heliotherapy are remarkable. Suppuration stops almost completely after an exposure of an hour or two a day for three or four days, and the action of the sunlight is also analgesic. If there is no sunlight hot air is the best substitute. As soon as pain stops passive movements should be begun. They should never be vigorous or extensive enough to cause pain and should be kept up for only a few minutes at first. At the end of two or three weeks the wire splint is removed and the arm put in a sling and soon afterward the patient is encouraged to try active movements. At the end of about a month massage of the biceps and triceps should be begun. This after-treatment requires a great deal of time and patience, and it is advisable to treat a number of patients together so that emulation is aroused in making active movements and noting progress.

If an ankylosis has been allowed to form, secondary resection is indicated provided the muscles are not atrophied and the nerves uninjured and the function of the hand normal, particularly if the ankylosis is in a bad position. The author has performed 9 secondary resections and has had good results in all, with movement through 60 to 90° at the end of three months. It often takes two or three years

before normal movement is completely re-established. In all of the cases except one pronation and supination were restored. A. Goss.

Sherman, W. O.: The Bone-plating Problem; Report of 200 Cases. *Internat. J. Surg.*, 1916, xxix, 2.

During six years with a fracture service of 3,100 cases Sherman has had to resort to plates in only 200 cases. Open operations are indicated in some cases, under the proper surgical environment. The teaching of extremists, who have advocated plating of all fractures of long bones, has resulted disastrously. The open operation is not a procedure for an "embryo surgeon." An acknowledgment that the majority of cases become infected and that in many cases the plates must be removed is no indictment against the method. Rather it is an evidence of faulty judgment in the selection of cases and gross errors in technique.

To properly do this work care and attention must be paid to the following factors:

1. The exclusion of the skin from the field of operation.
2. The proper armamentarium must be employed, and this is not possessed by the average hospital.
3. The cases must be properly selected. Ward patients who are anæmic, alcoholics, luetic patients, as well as obese subjects are poor subjects for bone-plating operations.
4. The operation should be postponed from 10 to 12 days after the injury to give the tissues an opportunity to react.
5. It is seldom necessary to drain.
6. The autogenous bone-graft operation is the operation of choice in non-union cases.

The results of operation have been superior to conservative methods in properly selected cases, as is evidenced by the fact that permanent disability in these cases has been reduced.

The author does not advise operation in any case until all other methods have been tried and found wanting. Isidore Cohn.

Hawley, G. W.: The Fate of Bone-Grafts. *Am. J. Orth. Surg.*, 1916, xiv, 29.

The author endeavored to stabilize the ankle in paralytic deformities of the foot by the use of bone-graft. The graft was inlaid vertically in a gutter cut in either the anterior or posterior surfaces of the tibia and astragalus. Technically, this provided ideal conditions because it brought periosteum to periosteum and endosteum to endosteum.

In calcaneovalgus deformities the graft was placed across the front of the joint in order to check dorsal flexion more effectively. In equinovarus cases the inlay was placed on the posterior surface in order to lock plantar flexion.

In most of the cases the lower end of the graft was carried down to and into the os calcis. In all of the cases it was possible to mortise the transplants in so tightly that they could be removed only with difficulty, and no sutures were required to hold them in place. Post-operative immobilization in plaster was carried out over a period of from eight to twelve weeks.

In the six cases reported the results were as follows:

In a girl of eighteen, nine months after operation atrophy of the graft was found at the point where it bridged the joint. Where it was embedded in bone it was as dense as ever. The atrophy increased until a year later the dissolution was complete and joint motion returned.

In a patient aged five years, ten months after operation complete atrophy of the graft opposite the joint was noted.

Cases 3, 4, 5, and 6 showed similar changes.

Those parts of the graft inlaid in bone remained vigorous and strong, while only those portions opposite the joint atrophied. Recurrence occurred in 5 of the 6 cases; in one case ten months after operation, in three within twenty-one months after operation, and in one case the date of the recurrence was not known. Philip Lewin.

Ritschl, A.: Ten Rules for Amputations of the Lower Limbs (Zehn Regeln fuer Amputationen an den unteren Gliedmassen). *Med. Klin.*, Berl., 1915, xi, 1270.

Ritschl gives the following ten rules for amputations of the lower limbs.

1. It is of great importance that the stump should be capable of bearing the weight of the body; this keeps it strong as well as avoiding artificial supporting surfaces, which are of less value.
2. A circular incision seldom gives a weight-bearing stump, because it makes the scar pass across the end of the bone.
3. Whenever possible flap methods should be used, care being taken to make as small a scar as possible on the lateral surface of the stump.
4. By removing the periosteum and bone-marrow for 1 to 2 cm. the stump can be made painless.
5. As soon as the wound is healed the stump should be hardened with baths, alcohol rubs, massage, and using it on crutches.
6. The muscles of the rest of the limb should be strengthened by active gymnastics, and the joints should be kept active by passive movements.
7. As soon as possible the patient should be provided with an artificial limb.
8. If the amputation was above the knee the artificial leg should be provided with a knee-joint.
9. The uninjured limb must be kept from atrophy by gymnastic exercises while the patient is in bed, as greater demands than usual will be made on it later.
10. For the same reason any decreased functional capacity of the uninjured limb should be given especial attention and treatment, such as active gymnastics and orthopedic treatment for actual or threatened flat-foot. A. Goss.

Hans, H.: Technique of Secondary Plastic Operations on Amputation Stumps (Zur Technik der sekundaeren Hautlappen plastik bei Kriegsamputierten). *Med. Klin.*, Berl., 1915, xi, 1290.

Many circular amputations have to be done at the front and the patients are sent to the hospitals in the interior with directions to reamputate or do a plastic operation. The author prefers the latter as it avoids a secondary mutilating operation and he has had the best of results. If the amputation is in the upper part of the humerus he brings the stump over against the thorax, marks out a flap on the skin of the desired size and shape, dissects up the flap of skin and fascia except at its base, covers the stump with it, bandages the arm to the side, treats the wound antiseptically, and after about ten to fifteen days separates the base of the flap.

The procedure is the same in other amputations and illustrations are given showing the points at which the skin-flap is most conveniently made in various sorts of amputations. Massage of the stump should be begun early so as to make the flap freely movable over the stump. The fascia unites with the muscles on either side of the bone and enables the antagonistic muscles to act normally, and as the result of active use a sort of mucous bursa finally develops, such as exists normally over other points of pressure, for example, the olecranon. The operation in itself is simple, but it demands careful and patient after-treatment. A. Goss.

Gost, O.: Contribution to the Osteoplasty of the Extremities (Beitrag zur Osteoplastik der Extremitaeten). *Beitr. z. klin. Chir.*, 1915, xcv.

Of 325 cases reported in the literature, autoplasty was performed in 220, or 67 per cent. Of these 220 cases, 68.8 per cent are reported cured. Homoplasty was used in 22.8 per cent, with 26 per cent cured. Heteroplasty was performed in 11 per cent of the total number of cases, the statistics showing 76 per cent cured.

The author reports 2 cases of sarcoma of the upper end of the tibia in which resection and later an autoplastic transplantation, by means of a splint taken from the other tibia, were performed. Good results were obtained, and the patients were able to walk without support, especially in the first case, a boy of four years. In the second patient, aged seventeen, the result was somewhat impaired by the formation of a pseudarthrosis at the upper end of the implant. As far as the epiphyseal cartilage is concerned, the first case shows that the irritation caused by the implant acts as a stimulus for epiphyseal activity, and rather enhances the growth. A. Steindler.

ORTHOPEDICS IN GENERAL

Langnecker, H. L.: Lesions of the Lumbosacro-Iliac Region: a Study of the Various Types. *J. Am. M. Ass.*, 1915, lxv, 1866.

The author calls attention to the close functional relation between the lumbosacral and the sacro-iliac articulations. He divides the lesions in this region into three classes: (1) traumatic, (2) static, and (3) toxic.

The traumatic class is further subdivided into the acute and the chronic. In the latter the trauma may be recurrent. Examples of the acute lesion are seen in strain during lifting, childbirth, anæsthesia, etc. The pain is sharp and increased by movement and is localized over the sacro-iliac joints or radiates down the leg.

In the chronic type relaxation, occasional displacement and adhesions are present. Flattening of the lumbar spine is present in both types. In the postural type relaxation of the muscles and ligaments plays the chief rôle, the lumbar curve is increased, and the pelvis is tilted forward.

Contrary to the two types first mentioned, the lesion in the latter is usually bilateral. General debility, anatomic variations, incorrect clothing, faulty weight-bearing conditions, and pregnancy may be factors. In the toxic type the symptoms are of gradual onset. There is much limitation of motion and while pain is apt to be more localized it may be referred up the back or down the leg. In concluding the author states that differentiation of the various types is not difficult if one bears in mind the fact that in the traumatic group injury with a sudden onset of symptoms is most important. In the static group the defect of posture with marked relaxation of the joints is present, and in the toxic group the history of an inflammatory process with a tendency to fixation of the joints is found.

F. J. Gaenslen.

Cooley, E. L.: Deformities of the Foot; Static Foot Trouble. *J. Mo. St. M. Ass.*, 1916, xiii, 10.

It would be expected that the predisposing causes of static foot troubles such as weak, flat, abducted, and pronated feet and a rational line of treatment would be well established among the profession at this late day but unfortunately such is not the case. Routine measures, especially in the diagnosis and treatment of these conditions, is the order of the day. One justly famous orthopedic surgeon never employs a foot brace of any kind in treating these deformities, while another equally famous orthopedic surgeon never treats a case of faulty weight-bearing without the use of flat-foot plates. The routine varies and different routines have different results, but the evil of routine treatment exists in all. Every case of static foot trouble, of whatever kind, is a law unto itself and demands the same individual differentiation accorded by the oculist to those suffering from defective vision. The author discusses very thoroughly the causes, symptoms, pathology, diagnosis, and treatment of these conditions. R. B. Cofield.

Martin, W.: Flat-Foot; Its Relation to Neuritis and Its Treatment. *Med. Rec.*, 1916, lxxxix, 101.

The author reviews the symptoms, the anatomy of the arch of the foot, his treatment of flat-foot,

his treatment of neuritis, and reports several cases of this condition.

He believes that there has been little attention paid to the result of fallen or relaxed arches upon the sciatic nerve. Many patients with flat-foot may complain of pain in the back, along the sciatic nerve, as well as pains in the arch and ball of the foot. He believes that often the neuritis may be the cause of the flat-foot, and that the neuritis is primary. The anatomy of the foot is reviewed in some detail.

In the description of flat-foot, he lays great stress upon the turning out of the os calcis. The neuritis is determined by electrical reaction and tenderness over the nerve. In the treatment, if the arch is only relaxed, exercises for the feet and care of the neuritis will usually bring about a cure. If the arch is flat plates are made which tend to rotate the os calcis. Exercises should be continued at least a year.

For the neuritis he uses static electricity and hot applications; all obvious sources of infection are cleared up and diet and toxic intestinal conditions are looked after.

C. C. CHATTERTON.

SURGERY OF THE SPINAL COLUMN AND CORD

Landry, L. H.: Extraction of Exploring Needle Broken in Attempting to Do a Spinal Puncture for Diagnostic Purposes. *N. Orl. M. & S. J.*, 1915, lxviii, 404.

Cases of foreign bodies in the spinal canal are infrequently reported. The case Landry cites had a needle broken off so that the end was in the spinal canal. The man complained of severe headache and pain radiating down the thighs, and in the back on flexing the spine. X-rays located the needle, which was extracted after half an hour's search after removing the spinous processes of the third, fourth, and fifth lumbar vertebræ. The patient was able to walk in a week.

Landry concludes that in exploring, the patient should be warned not to straighten up; the skin should be incised; a platinum or at least a bright needle with a short point should be used and the course of the puncture anæsthetized.

C. A. STONE.

Schoenbeck, O.: Dangers of Lumbar Puncture (Die Gefahren der Lumbalpunktion). *Arch. f. klin. Chir.*, 1915, cvii, 309.

Quincke first proposed lumbar puncture in 1891 for hydrocephalus. Since that time the indications have been extended to a number of other conditions, and it is used for diagnostic even more than for therapeutic purposes. But it is not without unpleasant by-effects, a number of which are described, and in a considerable number of cases it has caused death. Schoenbeck gives the histories of 71 such cases that he has collected from the literature and says that perhaps many have occurred that are not reported. He gives a bibliography of 137 titles.

Among the author's cases there were 37 of intracranial tumors, 2 of cysticercus, and 1 of echinococcus cyst; that is to say, in 40 cases there were conditions that decreased the size of the intracranial space.

The other cases were: hæmorrhage 13, uræmia 4, meningitis 7, prolongation of the cerebellum into the foramen magnum 2, acute myelitis 1, cerebellar abscess 1, pneumonia in a rachitic child 1, tumor of the cervical cord 1, anæmia of the brain and œdema of the lungs 1.

It has been said that the serious consequences of lumbar puncture are due to removing too much fluid, but in 15 of these cases less than 5 ccm. was removed, which is less than the amount considered necessary for diagnostic purposes. In 7 of the cases death occurred during or immediately after the puncture, and in the others after intervals varying from a few minutes to several days. There was generally a great fall of pressure after the puncture —in one case amounting to 60 mm. Hg. after the removal of only 30 ccm. fluid. In some of the cases there were doubtless defects in technique, but deaths have occurred with the most careful technique.

It would seem from the reports that though lumbar puncture is harmless in the healthy it may have the most serious consequences in pathological conditions, particularly so in cases of hæmorrhage into the skull or vertebral canal and in intracranial tumors. Caution should also be observed in cases of uræmia, inflammatory conditions of the central nervous system, brain abscess, arteriosclerosis, and suppurative meningitis.

In cases of intracranial tumor certain precautions should be observed. The patient should rest in bed for twenty-four hours before the puncture; he should lie on his side with the head low during the puncture; close watch should be kept over the changes in pressure in the fluid; the patient should rest in bed afterward for twenty-four to forty-eight hours, with the head lowered for the first twelve to twenty-four hours; alcohol and all excitement should be avoided after the puncture and the transition from the lying to the erect position should be gradual. These precautions, except as to keeping the head low, should be observed in all punctures. Aspiration or ambulant puncture should never be attempted. The dangers consist chiefly in producing a hæmorrhage into the vacuum created and in obstructing the communication between the cavities.

A. GOSS.

Fearnsides, E. G.: Gunshot Wound of the Lumbar Spine; Injury to the Cauda Equina; Destruction of the Pelvic Autonomic Nerves; Paralysis of the Large Intestine and Rectum; Recurrent Attacks of "Intestinal Obstruction." *Proc. Roy. Soc. Med.*, 1915, ix, *Neurol. Sect.*, 32.

Fearnsides reports a case of shrapnel injury to the cauda equina occurring June 22, 1915, in which the coccygeal and sacral roots were injured on both sides; the fifth lumbar roots of the left side also suffering slightly. The chief interest was in the abdominal symptoms which subsequently developed.

The patient came under the author's care twenty-five days after the injury. At that time he suffered from incontinence of urine and fæces and other evidences of injury to the sacral nerve-roots.

The following month brought no material change in the signs of nervous interference. On August 24th, the patient complained of abdominal discomfort and was restless and irritable. There was tenderness in the right lower quadrant. The following day the pulse-rate rose from 80 to 130, the abdomen became distended, and the patient began vomiting. On the fourth day he presented "abdominal facies;" the abdomen was distended and rigid in both iliac fossæ. The abdomen was opened. The appendix and peritoneum appeared normal. The large intestine, the transverse and descending colon particularly, was distended. The cæcum contained much gas and the lower ilium contained fæcal masses.

The abdomen was closed. A large fæcal accumulation was removed by the use of high enemata and mechanical digging. This was followed by marked improvement.

During the following three months the patient suffered three other attacks of "pseudo-obstruction" with intervals of from four to six weeks. Each attack occurred after a period in which the bowels were acting normally as regards frequency, quantity, and appearance of the stool.

The author called attention to the nerve supply of the intestine: (1) that portion above the transverse colon being supplied from the lower thoracic nerves through the splanchnic nerves; (2) the remainder being supplied by the pelvic autonomic outflow from the post-pelvic portion of the sacral cord in which region there is unequivocal evidence of gross injury. The afferent fibers, running through the posterior root ganglia, having escaped injury as evidenced by the referred pain and tenderness along the ninth, tenth, eleventh, and twelfth thoracic nerves.

G. D. THEOBALD.

Wolcott, W. E.: Pott's Disease Treated by Operation; a Report of Six Hundred and Eighty-Two Cases. *J. Am. M. Ass.*, 1916, lxvi, 108.

Statistics on the operative treatment of Pott's disease were secured by Wolcott by sending a questionaire to the various surgeons in this country who were interested in and had done either the Albee or the Hibbs' operation. Sixteen surgeons reported 642 cases. Of the total number of cases, 538, or 83 per cent, were benefited by the operation. Abscesses were present at the time of operation in 28 cases, in 7 of which improvement was reported after operation. In only 5 instances was there post-operative development of abscess. Paraplegia was present at the time of operation in 13 cases, in 7 of which there was improvement, but later there were recurrences in 2 cases, in the other 6 there has been no post-operative improvement of the paraplegia to date. Paraplegia developed after operation in 3 instances. There were 30 deaths, or approximately a mortality of 5 per cent; the disease in 6 of these cases was reported as having been arrested at the time of death. The causes of death were given as follows: tuberculous meningitis 7 cases, pulmonary tuberculosis 3 cases, miliary tuberculosis 5 cases, pneumonia 1 case, septic meningitis 1, fat embolus 1, status lymphaticus 1, acidosis 1, and pyæmia 1. In the remaining cases the cause of death was not given.

Of the 16 surgeons reporting, 12 considered post-operative support necessary and considered the operative procedure as a most valuable aid to the treatment of Pott's disease in selected cases. Four considered the post-operative support unnecessary after the period of recumbency, accepting Albee's idea that a certain amount of motion would stimulate and hasten the formation of ankylosis.

After a careful consideration of the facts obtained from various sources Wolcott concludes that these operations in a large percentage of cases abbreviate the treatment of tuberculosis of the spine by definitely hastening the curative ankylosis so necessary in this disease, and the likelihood of an increase in the deformity is proportionately decreased. These operations are best adapted to the treatment of Pott's disease involving the cervicodorsal, dorsal, or dorsolumbar regions.

R. B. COFIELD.

Davidson, A. J.: Bone Transplantation in Pott's Paralysis. *Therap. Gaz.*, 1915, xxxix, 761.

The author reports the case of an adult with motor paralysis progressive for five months in which he did a transplantation of bone-graft, after the method of Albee. He used the ordinary technique except that he used a table with canvas by means of which the patient was put in a hyperextended position during the operation. The patient was put in a plaster jacket and has been supported by apparatus since.

The patient was able to move both feet and thighs on the second day after operation, and in four weeks he was able to walk with slight assistance. Ten months after the operation the patient was in fine condition.

J. O. WALLACE.

Hodgson, F. G.: Congenital Deformities of the Vertebræ and Ribs. *Am. J. Orth. Surg.*, 1916, xiv, 34.

The author quotes Putti's classification as follows:

1. Numerical variations concerning the column itself as a whole.
2. Morphological variations concerning the individual elements of the vertebral column in their form.
3. Numerical plus morphological variations.
4. Faulty differentiation concerning not only the metameric but also the regional differentiation including the cervical rib and sacralization of the fifth lumbar.
5. Pathological variations including spina bifida, etc.

A costal anomaly is inseparably connected with a vertebral anomaly. The converse, however, is not necessarily true, for many cases are found with anomalies of the vertebræ but no anomaly of the ribs.

Congenital elevation of one or both scapulæ is also a condition sometimes found in connection with abnormalities of the vertebræ or ribs.

Four cases are reported and demonstrated by photographs and drawings.

The first case was a maldevelopment of the seventh cervical to sixth dorsal vertebræ, with fusion of the third and fourth ribs on the right side.

The second case was a maldevelopment of the first to tenth dorsal vertebræ with eleven ribs on one side and thirteen on the other.

The third case was a severe maldevelopment of practically all the vertebræ, with many ribs on both sides showing fusion and maldevelopment.

The fourth case was a severe maldevelopment of practically all the vertebræ and many of the ribs.

Hodgson thinks that many of the cases of structural scoliosis, scoliosis sciatica, painful back, etc., may possibly be due to some mild unsuspected congenital anomaly. PHILIP LEWIN.

Schanz, A.: Objective Symptoms of Insufficiency of the Vertebræ (Objektive Symptome der Insufficientia Vertebrae). *Arch. f. klin. Chir.*, 1915, cvii, 286.

By insufficiency of the vertebræ Schanz means a disturbance in the static balance of the spinal column—an inability of the column to support a normal weight or an overburdening of it that overthrows the normal balance. This disturbance of balance is accompanied by definite objective symptoms, most prominent of which is contracture of the long muscles of the back, eventually followed by contractures of other muscles. There is also inability to move the spine freely, the patients show a disposition to look for some artificial support and finally the vertebræ may assume deformed positions. The details of 40 cases are given with numerous illustrations. The contracture of the long back muscles is manifested in the illustrations as two long rolls running parallel to the spinal column. They can easily be distinguished in the picture from normal back musculature. The difference is even more evident on palpation; the normal muscles are soft and elastic, while the contracted muscles feel like firm, hard columns. Though this contracture is not mentioned in the textbooks, Schanz states that it shows plainly in the cases of spondylitis. It is not characteristic of spondylitis, however, but appears in any condition where there is a disturbance of static balance. The treatment of course is to endeavor to restore the normal balance, and if the treatment is effective this fact will be indicated by the gradual disappearance of the objective signs described. A. GOSS.

Els: Anomalies of the Sacro-Iliac Region in the X-Ray Picture (Anomalien des Iliosacralgelenkes im Roentgenbilde). *Beitr. z. klin. Chir.*, 1915, xcv.

In many instances of persistent backache, lumbago, and sciatica the author was able to demonstrate in the X-ray pictures distinct anatomical anomalies as the cause of the disturbances. This was especially true in instances of spina bifida occulta in fissures, and in incomplete fusion of the halves of the neural arches. Anomalies of the fifth lumbar and of the first sacral vertebra were also recognized as underlying pathological conditions.

In two cases a distinct spondylolisthesis with forward tipping of the body of the fifth lumbar and kinking of its neural arch was found. The pain in uncomplicated spina bifida occulta is usually localized around the sacrolumbar junction, but it not infrequently radiates into the gluteal and sciatic regions. An enlargement of the transverse process of the fifth lumbar may also be the cause of pain, due to pressure upon the nerve-roots. Suspicion of developmental anomalies of the sacrolumbar region may be aroused by weakness of the bladder, or by nocturnal enuresis. Local signs, as coccygeal dimples or retractions, are likewise important. The author makes extensive reference to the well-known investigations of Goldthwaite on sacrolumbar disturbances. Special consideration is given to the enlarged transverse process, secondary nearthrosis combined with arthritis deformans. formation of bursæ, etc., as etiological factors. A. STEINDLER.

O'Brien, F. W.: A Non-fatal Fracture of the Axis. *Boston M. & S. J.*, 1916, clxxiv, 85.

The author reports a case of fracture of the second cervical vertebra. The history was of a boy of seven who fell from a tree striking on his back. He was seen five days later. There was nothing remarkable about the child on examination except his carriage. No reflexes were disturbed. There was no paralysis of any muscle or muscle groups. Sensation was unimpaired. He was unable to move his head without pain, except by supporting his head with his upturned hand along the ramus of the jaw. This position made some motion possible. An X-ray showed a complete fracture of the laminæ of the axis. A support was worn for five weeks after which a second X-ray showed good union. The child now plays about as well as ever.

L. T. BROWN.

SURGERY OF THE NERVOUS SYSTEM

Troell, A.: Some Attempts to Produce Experimentally Conditions of Sympatheticotonus, Vagotonus, and Hyperthyroidism. *Surg., Gynec. & Obst.*, 1916, xxii, 81.

In order, if possible, to transmit and accumulate to the sympathetic and antonomic nervous system, respectively, for any length of time, the stimuli which are conducted from the central nervous system to the periphery through the phrenic nerve, and thus to produce conditions of sympatheticotonus and vagotonus, respectively, the author performed a number of nerve operations on dogs, cats, and rabbits. He cut the nerves in question in some animals in the neck, in others in the thorax. Then he joined with end-to-end suture the proximal end of the phrenicus with the distal end of the sympatheticus.

The animals, operated upon, were kept alive and controlled from 20 to 175 days after operation. The general condition, weight, pulse-rate, sugar tolerance, eye symptoms, etc., were examined and compared. But the results thus obtained did not show any symptoms which were unquestionably indicative of conditions of sympatheticotonus, vagotonus, or hyperthyroidism. Equally unsatisfactory were the macroscopic and microscopic findings in the organs at autopsy. It was never possible to note any agreement between the various individual cases along the lines of the operations performed. In part, the reason for this may be that so many different kinds of nerves were united, as those from the cerebrospinal system and from the sympathetic system (though a histological union of the axones had been brought about); also it is not to be denied that, in severing the phrenicus, centripetal communication and transmission through that nerve had been broken.

Gilpin, S. F., and Earley, T. B.: Drainage of Cerebrospinal Fluid as a Factor in the Treatment of Nervous Syphilis. *J. Am. M. Ass.*, 1916, lxvi, 260.

Arsenic and mercury in the blood do not give good results in nervous syphilis. This is due to the fact that these drugs are not found in the spinal fluid when given by mouth, skin, or blood-vessels. In investigating the reasons for this, one is handicapped by the lack of knowledge of the origin and function of the cerebrospinal fluid. The source of the fluid is thought to be from the choroid plexus and the cerebral capillaries; its function is probably to protect the nerve-centers and to prevent the effects of concussion, serving no lymphatic function. Frazier and Peet found that the cerebrospinal pressure varies with the pressure of the blood in the venous sinuses and is practically identical with it.

The same mechanism which prevents the entrance of many substances normally found in the blood into the cerebrospinal fluid is probably responsible for the failure of arsenic and mercury to enter the subarachnoid space. It was thought reasonable that if the pressure in the cerebrospinal cavity was reduced it might be possible to bring foreign substances through the capillary wall and thus secure the direct effect of such drugs on the nerve-tissue itself. In doing this the patients were drained, when possible, once a week, as much fluid as possible being allowed to run out, from 20 to 40 ccm. No bad results were noted. One case was drained fourteen times.

Three patients were treated by mercury inunctions and cerebrospinal drainage, one having received serosalvarsan intraspinally but without improvement. All three patients improved under drainage, and while it is admitted that three cases prove nothing, yet it is believed that there was enough improvement to warrant a report in order to stimulate further work. The reflexes were not helped but the mental and physical health and the ataxic symptoms were. E. K. ARMSTRONG.

Souttar, H. S.: Division of Right Anterolateral Tract of the Cord for Relief of Pain in Tabetic Crises. *Proc. Roy. Soc. Med.*, 1915, ix, *Neurol. Sect.*, 38.

Souttar relates the history of a case of tabes in which the crises became progressively more frequent and more painful during a period of four years in spite of active antisyphilitic treatment. The attacks were there rendered comparatively painless by division of the right antero-lateral tract.

When first seen the patient suffered an attack of abdominal pain and vomiting every one or two months and was incapacitated for the one or two days of their duration. There were irregular areas of diminished cutaneous sensation in various parts of the body. At the end of the four-year period the attacks were continuous with only an occasional day of freedom. They were accompanied by severe headache. The pain was limited to the left abdomen and the left leg, the hyperæsthesia was more extensive and more marked upon the left side, chiefly over the distribution of cervical 2, 3, 4 and 5, thoracic 11, 12, and sacral 1, 2, 3, 4. The knee-jerks were obtained sometimes readily and sometimes with difficulty.

At operation, the patient was placed in a prone position; the upper three dorsal arches were removed exposing about two inches of dura which was opened by a median incision. Silk threads were passed round the posterior roots of the second and third dorsal nerves and the cord rotated, bringing the right lateral surface into view. With a special triangular blade an incision, 2 mm. wide and 2 mm. deep, with its posterior extremity 3 mm. in front of the line of origin of the posterior roots and midway between the origin of the first and second dorsal

roots from the cord, was made in the cord. The patient suffered a very moderate degree of shock.

There was no paralysis following the operation and only slight post-anæsthetic vomiting. There were no changes above the point of operation. Below that point, the sensibility of the right leg was greatly diminished; the left side of the body and the left leg were entirely insensitive to pin-prick. In the same area cotton wool touch was perfect, heat and cold perfectly distinguished, and painful heat instantly felt as pain. Localization and joint sense were perfect. The knee-jerks were barely obtainable; the plantar reflex was downwards.

During the month following the operation there was great diminution in the areas highly sensitive to pin-prick, including that above the level of operation. The patient had only two attacks of vomiting accompanied by severe headache, no other pain.

Thoele: Injuries of Peripheral Nerves in War (Kriegsverletzungen peripherer Nerven). *Beitr. z. klin. Chir.*, 1915, xcviii, 131.

Thoele devotes 125 pages to an exhaustive discussion of nerve injuries during the war. He has operated upon 46 cases. He found that in about half of his cases the nerve was completely severed, a higher percentage than is given by most authors. The radial was injured more frequently than any other single nerve. It was impossible to tell clinically whether the nerve was completely severed or not.

The results of 48 operations are reported; two patients were injured in two different regions and had two different operations performed. Neurolysis was performed in 17 cases, 9 simple and 8 complicated. In the 9 simple cases there were only two complete recoveries. In a third case the paralysis of the ulnar recovered, but with contracture of the third to the fifth fingers. In 3 more cases there was marked improvement which will eventually probably be complete recovery. There was slight improvement in one case and no improvement in 2. Of the 8 complicated cases there was slight improvement in 4 cases and very marked improvement in 4.

In 11 cases of complete severing of the nerve the ends were freshened and sutured. There was improvement in only 4 of these cases; complete recovery in none. In 10 cases the nerves were cut and sutured on account of spindle-shaped thickening; they were only partially severed. There is beginning motor improvement in 2 cases, and improvement in the electrical reaction in 2, though paralysis is still complete. The time is too short to judge of the other cases. In 5 cases the gap was bridged with flaps from the peripheral end of the wounded nerves. In one case there was only slight improvement. In 4 cases the fibers were separated and the injured ones sutured, with 2 positive and 2 negative results. In one case the peripheral end of the injured peroneal was implanted into the tibial which was also paralyzed from pressure by cicatricial tissue. There was no recovery of the motor power of the peroneal, though sensation was restored; the tibial recovered after neurolysis.

In general Thoele believes that when there is motor paralysis with partial reaction of degeneration it is best to wait six to eight weeks after the wound is healed in the hope that motility will be restored. In complete motor paralysis and complete reaction of degeneration operation should be performed as early as possible. Of course this may mean a delay of some weeks for the wound to heal, especially if there is suppuration. By early operation he means only as early as possible under aseptic conditions. This may mean from three weeks to three months after the injury. In partial paralysis with partial or complete reaction of degeneration it is best to wait 6 to 8 weeks after the healing of the wound. Operation should be performed as soon as possible in cases where there is extreme pain.

Operation should be done under general anæsthesia. There is apt to be secondary hæmorrhage after local anæsthesia and, moreover, the electrical reaction of the nerve cannot be tested during the operation if it is infiltrated with novocaine. He prefers not to cut off the circulation with the Esmarch bandage, because when it is applied vessels are overlooked, which cause secondary hæmorrhage and lead to the formation of scar tissue again. The incision should be made in such a way that the skin sutures do not come over the nerve-sutures. If this cannot be avoided a flap of fat or muscle should be interposed over the nerve. Many surgeons make a sheath of fascia around the nerve, and various other substances have been proposed for these sheaths, such as calves' arteries, pieces of vein, rubber tubes, etc. Thoele believes that these sheaths contract and cause adhesions and strangulations of the nerve, so he thinks it is better to use only a flat flap of muscle or fat, not enclosing the nerve in a sheath. The different bundles of the nerve have different functions, so it is important to bring the corresponding bundles together in suturing. The nerve should be spared manipulation as much as possible. In seizing it with forceps only the nerve-sheath should be grasped, not the nerve substance. When nerves have to be held aside it should be done with strips of gauze, not with instruments. The sutures should pass only through the epineurium. The stumps must be brought together without tension. Three or four button sutures are enough. Better adaptation is obtained with these than with a circular suture of the sheath. It is well to flood the nerve after suture with a 0.5 per cent novocaine-suprarenin solution. The limb should be placed in the best position to relieve the nerve from tension and it should be kept in a plaster cast for three to four weeks. When the gap is too great to admit of direct suture a flap is made from the injured nerve itself or from another sensory nerve. Where the nerve is only partially severed the author does not advocate complete section and suturing, but dissociation of the nerve-fibers and suture only of the injured ones, leaving the uninjured ones intact.

The after-treatment consists of electrical treatment with the galvanic current, for the faradic current has no effect; mechanical exercise; and local baths of various kinds. Neuralgia is not always overcome by neurolysis. Heile thinks that excision of the perineurium is of value in neuralgia. In severe cases of neuralgia in mixed nerves where neurolysis has not been effective Thoele resects the sensory tracts from the nerve-trunk. In purely sensory nerves he resects and sutures if there is scar tissue, or resects a piece of the nerve and bridges the gap with a flap from the peripheral stump. A. Goss.

Bittrolf: Sheaths for Nerves After Suture (Umscheidung des Nerven nach der Naht). *Deutsche med. Wchnschr.*, 1915, xli, 1588.

At the site of the lesion the nerve is embedded in scar tissue that gives a grating sound under the knife. To prevent adhesions with surrounding tissues the nerve must be invested with a sheath around the sutured place. Bittrolf made experiments on dogs with anatomical results as follows: When the nerve was sutured and no sheath put around it, in three months it was surrounded by thick scar tissue. When a sheath was made of calves' arteries the nerve was free but the artery was loosely adherent to the surrounding tissues. Muscle-flaps became transformed into scar tissue, to which the suture place was adherent. Fat sheaths protected the sutured nerve but became adherent to the surrounding tissues. Treatment with roentgen rays after the nerve had been sutured and sheathed in these various materials had no visible effect. When a sheath was made of a celluloid-like material it healed by first intention and the nerve remained freely movable. A. Goss.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSES, ETC.

Martin, W.: The Significance of Foreign Bodies in the Tissues. *Ann. Surg.*, Phila., 1916, lxiii, 24.

Having in mind the very different significance of foreign bodies as a complication of gunshot injuries in modern warfare and as seen in civil practice, Martin reviews the known facts regarding the action of foreign bodies in the tissues in the absence of infection, as well as their action in the presence of infection.

Soft and absorbable foreign bodies are gradually dissolved and are taken up by the tissue-cells. Compact and insoluble foreign bodies are shut in by a connective-tissue capsule of new formation. No foreign bodies are chemically and physically indifferent to the tissues. The most characteristic cells in the reaction of the tissues to foreign bodies are the so-called foreign-body giant cells; they are frequently seen in scar tissue, around particles of thread, etc., and in some instances they resemble tuberculous tissue.

Foreign bodies are capable of changing their position in the tissues as well as being carried by the blood stream.

The tissues react differently to different substances: glass produces almost no reaction; copper produces a great irritation; silver the least of all the metals. The infected foreign body acts as a focus of infection because of the organisms introduced with it. It should be removed. Notwithstanding the wide difference between "war surgery" and "peace surgery," the author concludes: "Large incisions properly placed for drainage, removal of detritus, detached fragments of bone and tissue and all accessible foreign bodies, flushing the wound with H_2O_2, etc., has become the routine treatment for severe wounds. Isidore Cohn.

Lilienthal, H.: A Surgeon's Education in Cancer; Conclusions After Nearly Thirty Years of Clinical Observation. *Maryland M. J.*, 1916, lix, 1.

The author compares the present state of cancer surgery with that of thirty years ago. There is now "the presence of justified hope, where before there was a feeling of helplessness." He calls attention to the markedly better results obtained in mammary cancers, largely due to the earlier stage at which they are seen, and the extension of the operation to include removal of the pectoral muscles and removal of the axillary glands.

Stomach and intestinal surgery was rare thirty years ago. He now believes that in a subject over forty years of age we should operate for "persistent indigestion," and so eradicate many cases of early gastric cancer.

In regard to cancer of the thoracic œsophagus, he mentions the classic recovery of Torek's cases, and has confidence that success is a matter of time and the advance of technical methods.

In hypernephroma a solitary metastasis, if removed at the time of nephrectomy, will give a good chance for a long period of relief, and he feels that if no inoperable secondary tumor exists, multiple metastasis when easily removable, should not forbid nephrectomy with the simultaneous extirpation of the metastasis.

He advocates the use of Coley's fluid in sarcoma, in the inoperable cases, and after the extirpation of the growth.

In speaking of the clinical and laboratory diagnosis at the time of operation he advises the cautery knife for removing a specimen for examination. To spare the patient a hopeless and dangerous operation, he found useful the removal of a distant nodule, and in suspected gastric cancer, he has excised a lymph-node from the supraclavicular region.

This is commonest on the left side and he suggests that its presence may be accounted for by the proximity of the principal lacteal duct.

We are still confronted with two tragic obstacles. The first is the layman's fear of operation in cancer, and the second is the inexcusable attitude of procrastination which is still maintained by so many in the medical department of our profession.

D. L. DESPARD.

Bristol, L. D.: An Enzyme Theory of Cancer Etiology. *Med. Rec.*, 1916, lxxxix, 180.

Bristol attempts to harmonize the origin of cancer with the activity of enzymes. According to his theory, the first step toward a malignant proliferation is usually found in cell or tissue injury. This may be caused by physical, chemical, functional, nutritional, or infective agents, such as trauma, heat, X-rays, drugs, toxins, acids, and alkalies, or by chronic infection. In general, cancer follows injuries whose agents have their effect over a long period of time. The second step in the pre-cancerous period is that of inflammation. The author quotes Slye, "Cancer is a mode of growth probably allied to regenerative processes." Attention is drawn to the fact that the leucocytes, on breaking up at the point of inflammation, liberate an enzyme and possibly an activating agency that increases the rapidity of cell growth in the repair. Peroxidase has been identified in this situation, and is supposed to result from the breaking down of the bodies of the leucocytes.

A short dissertation is given on the enzymes and their nature, as well as their general mode of activity. They are substances of colloidal structure which have this in common, that they are able to accelerate chemical reactions. The term "enzyme" is thus included in the more general term "catalyst." In general the velocity of the reaction is proportional to the quantity of "catalyst." Endoenzymes are intracellular; exoenzymes, on the other hand, are eliminated from the cells from which they are formed and have their seats of action in the solutions outside the cells. Peroxidase is an example of the former, while pepsin in the gastric juice is an illustration of the latter group. The author's theory hinges on the activity of oxydizing enzymes. Acids and bases act specifically as activators of some enzymes and paralyzers of others.

The body tissues develop enzymes that are antagonistic, namely anti-enzymes, in order to hold in check any excess activity. Moderate heat acts as a stimulant of these bodies, whereas high degrees of heat destroy them. Light also acts in a similar way, as also does exposure to X-ray, so that there may be a double effect dependent on the dosage. Hydrocarbons of the paraffine group act as stimulants. He quotes Jolies and Oppenheim, "The catalase value for normal blood is 23. In carcinoma there is a greater decrease than in any other disease studied, the values of the blood falling from 1.3 to 2.1."

The author discusses the fact that lack of oxidization inhibits germination in seeds and cell division after fertilization of the egg. The rate of growth of both animal and vegetable life is influenced by factors such as oxydasis and X-ray, which act on enzymes. The author holds that the rate of cell-division is dependent on increased growth rate. He quotes Howard and Schultz, "Dynamic energy produced by cellular metabolism manifests itself in cellular growth and function."

In discussing the formative stimulus in cell growth, the author believes that the cause for this acceleration is "the catalytic action of local, concentrated oxidizing enzymes, particularly peroxidase, or an increase in their co-enzymes, or accelerators, in one or more previously normal cells; these cells take on a new independent energy production and growth rate as a result. The transmission of this newly acquired concentration, or accelerated action, of endoenzymes from parent cells to daughter cells, assures the progeny a permanent and independent increase in oxidations, energy production, growth rate, and division rate. This concentration may be brought about by the process of injury and inflammation, where the enzymes are liberated in abnormal amounts.

Attention is called to the prevalence of cancer in chimney sweeps and in those carrying burning charcoal braziers hooked to their belts, as an instance of the rôle that heat may play in the production of cancer. According to the author's theory the difference between the normal cell and the cancerous cell is essentially a difference in the speeds of their biochemical reactions. The normal coexisting exoenzyme activity in the body is regulated and held in check by anti-enzymes. A lack of these anti-enzymes in cells where oxidizing enzymes are in predominance, might lead to the lawless growth of cancer.

Various theories that have already been advanced for the causation of cancer are discussed, and harmonized with the author's enzyme theory. As it applies to benign tumors, the author's supposition is that it acts only in degree, rather than differently, so that the cell growth is neither as rapid nor lawless. His conclusions are (1) that cancer is the result of localized, unchecked, hyperoxidation in epithelial cells; (2) that this condition is brought about by concentrated, accelerated, and uninhibited action of intracellular oxidizing enzymes, as a result of various injurious agents. It is evident that here, as elsewhere in pathology, we are dealing not with independent problems, but with specific outlooks only on the wider field of the general field of biology.

H. S. SLOAN.

Beuren, F. T., Van, Jr.: The Anatomic Distribution of Cutaneous Neoplasms. *J. Am. M. Ass.*, 1916, lxvi, 111.

During a period of nine years histological diagnoses were made on 352 tumors of the skin. An examination of the anatomic distribution of the more

important groups shows that of 122 epitheliomata 75 per cent were located above the clavicle and 84 per cent on the uncovered surfaces of the body. Epitheliomata of the forehead, scalp, and cheek are evenly divided among the squamous and basal-cell variety; all those on the lip and nearly all those on the neck and hand were squamous, but 11 of 13 on the nose were basal-cell. Of papillomata nearly half, 49 per cent, were above the clavicles and 75 per cent were on the unclothed portions of the body. The angiomata also preferred the same regions, 57 per cent being above the clavicle and 81 per cent on unclothed surfaces. On the other hand, fibromata, sarcomata, and melanocarcinomata show a distinct preference for the covered parts, occurring on the unclothed parts in 40, 33, and 11 per cent, respectively.

In short, of malignant tumors, the epitheliomata show a distinct preference for the head and neck, the sarcomata and melanocarcinomata for the trunk and extremities. The former favor unclothed, the latter covered parts of the body. The large majority of epiblastic tumors, irrespective of malignancy, occur on unclothed surfaces, while those of doubtful or frankly mesoblastic type occur chiefly on the clothed portions. E. K. ARMSTRONG.

Gillette, W. J.: The Use of Steam in the Treatment of Superficial Cancer. *Med. Rec.*, 1916, lxxxix, 65.

Following the lead of Byrne, Fredericks, and Percy who used heat to destroy cancer tissue, the author has used superheated steam with great success in the treatment of fungating cancer and sarcoma masses. In sixteen cases there has been recurrence in only four and in one of these resteaming gives prospect of ultimate cure. While recurrences are still possible in the others, all are clinically well at the present time.

Under proper pressure steam may be made to penetrate to the depth of an inch or more, but not readily through fascia or thick fat. This difficulty may be overcome by puncturing with the scalpel, or removing entirely, any fascia over which it is to be applied. As steam follows the line of least resistance cancer tissue will usually be invaded while the surrounding tissue is left intact. Absence of pain is noticeable.

For the employment of steam Gillette uses metal shells enclosing tubes through which steam is forced at a boiler pressure of fifty or fifty-five pounds into the tissue. The shells act as a protection to the tissues it is not desired to treat. The steam is carried in through the handle by means of fiber-tubing and out again after use by way of a small nipple at the upper end. E. K. ARMSTRONG.

Holt, O. P., and Ratterman, H. T.: Multiple Metastatic Sarcomata of the Lungs; Report of a Case. *J. Am. M. Ass.*, 1916, lxvi, 171.

The patient, a widow, aged 54, was admitted to the hospital May 16, 1915. Her chief complaint was pain in the left lower chest, through and through the lung at the scapular level. The family history was negative for tumors.

In the summer of 1912, the patient noticed a firm swelling which appeared over the upper part of the right tibia just below the knee. This lump gradually grew in size and in September, 1913, was opened to allow drainage. No pus was found. The incisions were allowed to heal and had almost closed when there was evidence of an active tissue proliferation with protrusion of the tumor substance at the site of the first opening. A diagnosis of sarcoma was made and on December 19, 1913, the leg was taken off above the knee. The pathologist reported the specimen to be oatgrain-cell sarcoma.

During the winter of 1914–1915, the patient began to feel pain under the left shoulder blade and under the left arm. She took one cold after another. She coughed considerably in spells, but expectorated very little and seldom. During one severe coughing spell she brought up an old blood-clot with some phlegm. She lost weight steadily and rapidly. There were no night sweats, and no gastric or bowel symptoms.

The chest findings were interesting. The respirations were somewhat rapid. The expansion was fairly good, but the excursions were more limited on the left side. The supraclavicular and infraclavicular fossæ were deep and well marked, especially on the left side. There was dullness over both apices and dull areas scattered over both lungs. There was a large area of dullness in the left axilla extending anteriorly. The breath sounds were roughened and the breathing bronchovesicular over the dull areas with medium moist and dry râles during and at the end of expiration.

A roentgenogram showed multiple rounded opaque areas scattered throughout both sides of the chest. These areas varied in size from that of a five cent piece to that of a silver dollar. They looked typically like malignant metastatic deposits, in all probability sarcoma.

The patient died June 20, 1915, without regaining consciousness. When the chest was opened at necropsy, the lungs did not collapse. The diaphragm reached to the fifth rib on the left and to the first interspace on the right. In the left pleural cavity there were recent fibrinous adhesions laterally and anteriorly above the level of the nipples; in the right there were similar adhesions over the posterior part of the upper lobes. All these adhesions were over nodular masses situated in the lungs beneath the pleura. Beneath the sternum in the right lung were several of these nodules with well-formed fibrous adhesions between them and the sternum.

Both lungs were filled with large and small nodular growths, which varied in size from a small pea, in one case, to a small orange, 8 cm. In the left lung most of the nodules were softened and, when traction was put on the lung, they ruptured and the contents came forth looking somewhat like moist cottage cheese. In one instance a nodule was

situated in an infarct caused (apparently) by pressure of another mass on the vessels of the part. The smaller, better nourished growths were clear, pearly white in color, were rounded or oval, and had something of the appearance of soft fibromata; that is, they were indistinctly striated or lamellated and juicy. Older ones, which had not undergone distinct softening, were often darker in color, sometimes with lines of greenish or olive across the grayish surface of the growths. The pleura above all the subpleural nodules was inflamed. Microscopic examination of the tumor masses showed them to be spindle-cell fibrosarcomata of the short spindle-cell variety, with a marked tendency to perivascular arrangement. EDWARD L. CORNELL.

Wood, F. C.: Action of "Autolysin" on Mouse Tumors. *J. Am. M. Ass.*, 1916, lxvi, 94.

In order to determine whether "autolysin" had any action on tumors in mice, 21 mice bearing spontaneous tumors were injected with "autolysin" in doses varying from 3 to 123 minims. No tests were made on animals bearing transplanted tumors for the reason that frequently such growths disappear spontaneously after the tumor has reached a certain size. Test injections were made upon normal animals to determine the toxicity of the "autolysin," using the oral dosage suggested by Beebe and Horowitz. It was found that the drug was nontoxic even in large intravenous doses.

There was no evident change clinically in the treated animals. No gross changes were observed in the tumors that were not also seen in untreated controls. At the site of injection there was found necrosis with leucocytic infiltration. Tumor sections showed an active state of growth, particularly well marked in those longest under treatment.

The conclusion arrived at was that "autolysin," either in large or small doses, does not affect spontaneous malignant tumors in mice.

E. K. ARMSTRONG.

Rohdenburg, G. L.: Irritation as a Factor in Malignant Tumor Development. *N. Y. M. J.*, 1916, ciii, 201.

Rohdenburg cites four cases in which a simple form of irritation, harmless in the majority of patients, was apparently the cause of a malignant tumor.

In the first case, the pricking of a simple cyst of an ovary was followed in four weeks by an inoperable sarcoma of the same ovary. The second case was that of an adenocarcinoma of the perineum following a gonorrhœal abscess of a Bartholinian gland. A recurring fibrous osteitis of the jaw after a splintering of the bone by a tooth extraction and a carcinoma following a corn contituted the remaining cases.

The author emphasizes the close relationship between regeneration, as seen in healing, and tumor development. ALFRED H. NOEHREN.

Gruner, O. C.: A Study of Changes in the Leucocytes in Certain Cases of Malignant Disease. *Brit. J. Surg.*, 1916, iii, 506.

The author gives an original study of the leucocytes with relation to their form, amœboid movement, death form, etc., in cases of malignant diseases.

The author used smears stained by the Pappenheim method. His reasoning is that there is no primary specific disease of the blood itself, but that any changes occurring in the leucocytes are a result of the circulating metabolic changes or poisons in the blood stream.

He devotes especial attention to neutrophile leucocytes as regards the relation between juvenile and adult forms, relation of living to dead forms, presence of "bizarre" forms, presence of nuclear excrescences or pseudopods, evidence of active amœboid motion. In the lymphocytes he devotes attention to the ratio between juvenile and adult forms and the ratio of living to dead forms.

He found that a diet rich in purine bodies gave a blood picture closely simulating that seen in malignant disease, so he advises a purine free diet for several days before the blood examination is made. The blood findings of leucocytes depends on the actual composition of the serum, the degree of the vitality of the cells, and their individual idiosyncrasies.

A morphologic agent may stimulate the leucocytes to great activity, either reproductive or if it be phagocytic it will be shown in amœboid movement. It may further damage the leucocytes and cause the proportion of dead and dying leucocytes to increase.

Gruner draws the following conclusions:

1. If a smear shows neutrophilia and fat drops in any of the neutrophils, and if the nuclei of the neutrophils are largely multifid, the case is one of coccal infection of great or very great severity.

2. If the smear shows a relative absence of lymphocytes, if there is no leucocytosis, or if multifid nuclei preponderate, the case is almost certainly not one of malignancy.

If there is neutrophilia with bizarre forms or pseudopods in numbers, if the leucocytes in many instances show amœboid outlines, if the monocytes show amœboid nuclei the case is almost certainly one of malignant disease. HARRY G. SLOAN.

Gamble, H. A.: Acute Emphysematous Gangrene. *Internat. J. Surg.*, 1916, xxviii, 402.

The author reviews 11 cases of acute emphysematous gangrene, 10 of which occurred during the summer months and one during the winter season. Two were crushing injuries of the lower extremities, 1 a contused wound of the lower extremity, 6 gunshot wounds, and 2 were compound fractures of the tibia. In none of these cases was the blood supply in any way compromised after the receipt of the injury.

The systemic symptoms were those of a most intense toxæmia. Locally, there was a gangrenous

odor and a greenish black color on the surface of the wound, usually coincident with the development of crepitation in the surrounding tissues with œdema and swelling.

The prognosis is always grave. In the 11 cases there were 5 deaths and 6 recoveries, a mortality of 45.5 per cent. Treatment is both prophylactic and curative. It is essential that early thorough sterilization combined with free incisions for the relief of tension and the promotion of free drainage be adopted. Where possible the author amputates as far away from the site of infection as possible. The stump is bathed freely in tincture of iodine; the flaps are left open; silkworm sutures are introduced but not tied. C. G. HEYD.

Bishop, E. S.: Preliminary Considerations of Drug Addiction in Surgical Cases. *Am. J. Surg.*, 1915, xxix, 435.

Bishop says it has been his experience that the average surgeon expresses little or no interest in the addiction of patients to a narcotic drug and regards it as a condition which does not concern him. This position, he holds, is reasonable if the surgeon accepts the responsibility for his work in the operating room only, otherwise anything which influences the recovery and well-being of his patients should command his attention and consideration.

He believes that the medical profession as a whole has regarded the mere fact of continued use of a narcotic drug as the element of paramount importance in narcotic drug addiction, and that too little attention has been given to the actions of the drug of addiction upon the person addicted and to the influences of the physical addiction mechanism in the healing and repair of other conditions. He points out that very many surgical cases have terminated unsatisfactorily, simply and solely because of the surgeon's failure to grasp the importance of, and his inability to understandingly deal with, addiction to a narcotic drug existing intercurrently in a surgical case. The surgeon is not to be blamed in this attitude toward the addict as in it he simply reflects the opinion of his medical brethren and the weight of their authority. The general medical consideration of the treatment and care of drug addiction has been too much concerned with the mere fact of continued use of the drug, and too much confined to efforts directed toward the mere withdrawing of the drug.

The reputation that a drug addict has as a poor surgical risk and a difficult case for surgical handling, and the frequent refusal of surgeons to operate upon addicts until they shall have stopped the use of their drug is unjustified by clinical fact. Disagreeable course and unsatisfactory issue in the surgical handling of a narcotic addict are to be laid at the door of insufficient medical appreciation of addiction disease mechanism and its functional and organic influences, and inadequate clinical ability to analyze, estimate, and control these elements. The addict is not a poor surgical risk because he is an addict; and his lack of repair and slowness of recovery — in the experience of many surgeons — as a rule has not been due to the existence of his addiction. These things have been due to the surgeon's lack of appreciation of addiction disease mechanism and his inability to competently control it. Competently controlled addiction disease mechanism can often constitute a helpful post-operative influence rather than a hindrance. A very large number of addicts have been operated upon and have gone through a satisfactory recovery and convalescence without the attending doctors' realization of the existence of their addiction. The intelligent addict entering upon an operation or illness almost invariably makes provision for a sufficient supply of his drug and himself controls his addiction disease mechanism.

The mere fact that a patient is using a narcotic drug and that he uses, within reasonable limits, a larger or smaller amount of that drug is a matter of very minor importance as compared with his functional, nutritional, and metabolic efficiency. The satisfactory recovery of a narcotic addict from a surgical or medical condition for which he is being treated depends to a great extent upon his functional balance and his organic and metabolic adequacy, and these elements are largely under the control of and vary with the extent to which the patient is kept in adequate narcotic drug balance. Attempts at reduction of dose below the amount of actual physical need in a narcotic addict is without justification during the course of surgical or other medical treatment. The establishing and maintaining of competent narcotic drug balance is one of the most important elements to be considered in the handling of a narcotic addict undergoing operation. Attempts of surgeons to unreasonably reduce or withdraw narcotic drugs as a desirable incidental procedure in the course of treatment for other disease conditions is inexcusable. It is too harmful a procedure to meet anything but condemnation. The author believes that failure will almost invariably result from an attempt at remedying narcotic addiction and, what is far more important, the result of the surgical efforts may be seriously handicapped and the issue seriously jeopardized.

The author believes that the complete and successful withdrawal of a drug of addiction is a matter of comparatively easy and assured accomplishment in the hands of a man who has learned to recognize, appreciate, measure, and control the elements which constitute and complicate addiction. It is a matter of extreme difficulty and is rarely successful in the hands of a man who does not understand these elements, and who cannot with clinical comprehension and intelligent understanding of the mechanism of addiction conduct a case of narcotic drug disease. The final withdrawal of the drug is comparable to an operation of election, and the time of its execution is a matter of arrangement and of preceding preparation. It should never be undertaken with the expectation of satisfactory issue in

the course of treatment for any ailment which demands the expenditure of recuperative powers. Recuperative forces should be maintained and directed toward whatever is the need of paramount importance at any given time. In a surgical case the indication of paramount importance is recovery from the condition for which the patient applied to the surgeon. The proper control of narcotic addiction mechanism and of its influences upon the patient addicted is the important problem presented by narcotic addiction as met in the field of surgical work.

Reilly, T. F.: The Signs and Symptoms of Impending Death. *J. Am. M. Ass.*, 1916, lxvi, 160.

The author discusses the symptoms and syndromes observed in cases where death impends.

Death usually occurs as a result of (1) heart failure, (2) respiratory failure, (3) asthenia, (4) vagus failure, or (5) shock, with the centers in the medulla the controlling factors rather than any organ. There are few single symptoms pathognomonic of death.

An irregular pulse for the first time in the disease or its disappearance from the wrist with the patient recumbent is alarming, except in cardiac disease or in sudden severe hæmorrhage. In the latter, if there is much jactitation death invariably occurs.

Pulsus alterans appreciated by the finger, means death within a short time. This is most common in fractures of the skull.

In adults, a pulse under 80 means that death is at least twelve hours away. In the aged, however, the pulse is often slow until death. In children, with a pulse under 120, death is rare within six hours.

Except in pericarditis, a pulse mounting gradually to 160 presages death; but the approach of death can not be foretold by the pulse as reliably in children and aged as in adults.

Cases of auricular flutter are very deceptive; the pulse may be 150 or more with extreme prostration, and recovery often occurs.

Gallop rhythm, not associated with rheumatic carditis, is always fatal. Of like import is a persistent, firm pulse in coma accompanied by hemiplegia. In all infectious diseases a strong pulmonary valve sound indicates that immediate fatal termination is improbable.

A high blood-pressure of 230 falling suddenly below 100 without hæmorrhage, means a fatal issue. Likewise, when it steadily falls in any adult to 40. In pneumonia, Gibson's rule is unreliable in children or the aged.

Cheyne-Stokes' respiration in the sick practically always heralds death except in uræmia or cardiorenal disease. Rapid breathing following this phenomenon indicates that death is at hand.

A marked disproportion between inspiration and expiration, especially if accompanied by rapid pulse, is a fatal sign; also cold respiration from the nose and mouth.

According to Shrady, a persistent up and down motion of the Adam's apple forshadows a rapidly fatal outcome. White frothy fluid from the nostrils announces the end.

Absence of pupillary reaction to light except in syphilis, brain diseases, optic atrophy, fainting, or hæmorrhage immediately precedes death; a sluggish reaction is serious. In most diseases, the pupil dilates widely just before death.

A film over the eyes, or tight closing of the eyes, with a firm, rapid pulse is a sign of impending fatality. Likewise, a turning of the eyes outward.

In children a passive congestion of the conjunctival vessels means approaching death.

A temperature of 108° F., except in heat stroke, is fatal. Likewise a rising temperature on the second day after onset of hemiplegia.

Loss of sphincter control is always a grave sign, especially when coma is not present.

In peritonitis, a fatal indication is a bright yellow discoloration of the tongue; likewise, black vomit forty-eight hours after operation.

Hæmatogenous jaundice following fevers, snake bites, and aphthous stomatitis in wasting diseases, means approaching death. Also the presence of persistent uncontrollable hiccough.

The appearance of large amounts of indican in the blood or transudates is a fatal indication. Subsultus tendinum and carphologia, except in typhoid, are of grave import.

Fibrillary heart-tremor in electric shock is always fatal.

The presentiment of a fatal issue by the patient at the onset of a disease is a bad omen. When a uræmic patient becomes jolly and bright a serious condition usually supervenes.

The author concludes with a short discussion of some of the superstitions of the laity in regard to the signs of approaching death. He believes that a number of them are quite logical. P. M. Chase.

BLOOD

Cropper, J. W., and Drew, A. H.: The Occurrence of Bodies Resembling "Seidelin Bodies" in Anæmic and Fœtal Blood; Their Probable Nature. *J. Trop. Med. & Hyg.*, 1916, xix, 20.

The authors report the occurrence of minute scarlet dots or granules with a bluish body resembling "Seidelin bodies," and indistinguishable from them, in the red cells of the blood of pernicious anæmia, of the human fœtus, of newborn kittens, and rarely in that of children suffering ordinary anæmia. They believed these bodies to be the products of the degeneration of the nuclei of erythroblasts.

The specimens were fixed and stained as recommended by Seidelin. Emphasis was placed upon the care necessary in the preparation and staining of the specimen, upon the avoidance of the slightest acidity in the water used, and upon the care necessary to avoid confusing stained broken down platelets, etc., with the bodies.

In the examination of the blood of 60 persons with-

out obvious anæmia no "Seidelin bodies" were found, and in the blood of 92 cases of ordinary anæmia, slight and severe, only eight definite bodies were found. The single case of pernicious anæmia examined showed them, and every specimen from the eight fœtuses and the six kittens showed them.

The bodies were described as being of three kinds:

1. A minute, highly refractile, red-staining granule without any blue-staining portion.

2. Blue-staining bodies without any accompanying granules. These were either ring-shaped, linear, or irregular.

3. One or more red granules either enclosed by, continuous with, or external to a well-defined blue-staining portion which appeared most commonly in the form of a ring. The red and blue bodies were generally close together and were eccentrically placed in the cell. The bodies belonging to this group resembled those usually described as "Seidelin bodies."

The authors state that the finding of these bodies in fœtal blood and in that of newborn kittens made it difficult to believe that they were parasitic in nature and associated with the virus of yellow fever. They suggest that their occurrence in the fœtal blood and in that of severe anæmia in which nucleated red cells appear in the circulation directed attention to their possible connection with the process of new blood formation. Further evidence in support of this view was secured by the study of the blood of newborn kittens in which nucleated red corpuscles, showing stages of degeneration of the nucleus from the normal cell to the ring-shaped blue body, similar to the "protoplasma body" of Seidelin, were found.

The red-staining granules were thought to be centrosomes, which have been demonstrated by E. H. Ross in nucleated red corpuscles of severe cases of secondary anæmia.

The conclusions drawn were: (1) that the bloods of pernicious anæmia of the human fœtus and of newborn kittens contain bodies which appear identical with "Seidelin bodies"; (2) that these bodies are apparently absent from the blood of the normal ordinarily anæmic adults, but are rarely found in the blood of anæmic children; (3) that the bodies are the results of the nuclear degeneration which takes place in the conversion of erythroblasts into the normal non-nucleated red blood-cells; (4) and that the red-staining granules are probably centrosomes.

JOHN W. TURNER.

Burmeister, W. H.: Resuscitation by Means of Preserved Living Erythrocytes in Experimental Illuminating Gas Asphyxia. *J. Am. M. Ass.*, 1916, lxvi, 164.

The literature of the subject is briefly discussed and two series of animal experiments are reported.

The author favors Haldane's theory that the central nervous system changes are secondary to the blood changes, and that death is essentially one of asphyxiation. In 1864 Hoppe-Seyler first noted the carbon monoxide hæmoglobin spectrum. Today the action of carbon monoxide in displacing the oxygen of the oxyhæmoglobin is fully established. The affinity of the former for hæmoglobin is 210 times as great as that of the latter. Air mixtures containing as little as 0.05 per cent carbon monoxide are definitely toxic.

Kuehne in 1864 was the first to successfully resuscitate animals by indirect transfusion of defibrinated blood. In 1900 Darrah reported 13 successful resuscitations by direct transfusion in dogs, and Crile and Lenhart reported 70 to 80 per cent recoveries by this means after all other known methods had failed.

The author followed Hustin and Weil's work with the indirect transfusion of citrated blood, and Rous and Turner's work with Ringer's solution. He mixed equal proportions of citrated blood and Ringer's solution containing 2.5 per cent dextrose, centrifuged just before use thus removing the larger part of the white corpuscles. The mixture remained unchanged for several weeks.

Twenty rabbits were asphyxiated until cardiac impulse ceased. Twelve received transfusions of prepared blood, with immediate recovery, although three died later, two due to hæmorrhage into the peritoneal cavity. The author believes venesection just before transfusion would have prevented this.

In the experiments on dogs, the asphyxiation of each animal was prolonged for 60 minutes so as to thoroughly saturate the blood with carbon monoxide. Forty dogs were used. Immediately following, attempts at resuscitation were started by artificial respiration and the injection of 1: 10,000 epinephrin directly into the heart. With these means, where the heart had not ceased beating more than three or four minutes it was possible to start contractions and slight respirations. Dogs only reacting thus were used for transfusion. Upon this occurring, 125 to 175 ccm. of the blood were injected and at the same time venesection done. Fifteen dogs lived under these circumstances, while five controls died. Four additional controls received only epinephrin and Ringer's solution. These all died. Of the fifteen dogs, twelve recovered with apparently no ill effects that could be due to the asphyxia.

The conclusions are as follows:

1. Erythrocytes of some animals can be preserved intact for a considerable time.

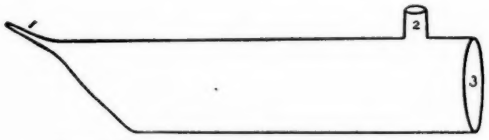
2. These can again assume their function in another animal of like species, and can prevent death from asphyxiation by carbon monoxide in about 75 per cent of all cases, provided cardiac contractions can still be elicited.

3. Emergency stations where these corpuscles could be obtained would prove invaluable in saving victims of gas asphyxiation.

P. M. CHASE.

Risley, E. H.: Simplified Methods of Transfusion. *Boston M. & S. J.*, 1916, clxxiv, 3.

The author has recently tried out the many advocated methods in the laboratory and makes the



1. Cannula end with ground-glass tip.
2. For bulb and tube (situated on side instead of as here drawn).
3. For cork stopper.

following suggestions for those wishing to do transfusion and who wish to have on hand simple means of assuring its success.

Every physician who contemplates doing transfusion at all should provide himself with the following apparatus:

1. Two large (100 and 300 ccm.) glass cylinders, like cut, which are easily obtainable at any glass-blower's for the small outlay of about two dollars.
2. Five hundred ccm. in two bottles, of sterile 2 per cent sodium citrate solution. This can be re-sterilized by boiling repeatedly without deterioration.
3. A glass graduate (25 ccm.).
4. A set of glass syringes (two 5 ccm. and one or two 20 ccm.).
5. Two 16-gauge cannula-trochars.

With this equipment one will be able to do successfully any transfusion he may be called upon to do.

EDWARD L. CORNELL.

BLOOD AND LYMPH VESSELS

Johnsen: Treatment of Aneurism (Behandlung von Aneurysmen). *Berl. klin. Wchnschr.*, 1916, liii, 72.

The author demonstrated at the Stettin Medical Society 16 cases of aneurism that he had operated on. The only treatment is operative. In pure arterial aneurisms there is always the danger of rupture until they have been operated upon, and even varicose aneurisms and aneurismal varices are to be treated surgically, for otherwise the continuous arterial pressure on its walls gradually increases the distention of the vein, while the nutrition of the peripheral parts suffers from the gradual withdrawal of more and more blood from the arterial system. He recommends suture of the vessel wall as the method of choice and thinks Matas' operation should be reserved for cases where suture is impossible. Continuous suture by Carrel's method is recommended, and the author also describes the technique of his method of suturing over glass rods. He does not advise cutting off the circulation with an elastic bandage, because it makes it more difficult to dissect out the vessels, and also because there is danger of injuring the vessel walls by the ligation, and this means more danger of thrombosis.

The best time for the operation is about the sixth week, and up to that time strong steady pressure should be applied to the aneurism. There is no advantage to be gained by extensive pressure treatment, and it offers no hope of cure. It is inadvisable to operate sooner because of the imbibition of the tissues and the difficulty, resulting from it, of making out the anatomical relations.

In the discussion LICHTENAUER stated his belief that vessel suture is the ideal method, but that it is by no means always possible to use it. There is danger under some conditions of injuring the collaterals, and the collateral circulation is particularly important in these cases, because of the uncertain results of suture. He has had a number of very satisfactory results with Kikuzi's and Matas' methods of operation. He thinks it best, when possible, to cut off the circulation during operation. In aneurisms of the upper part of the thigh he uses the Momburg method.

BETHE said that he had performed circular suture in 6 out of 21 cases of aneurism, but had been able to establish a permanent peripheral pulse in only one. In spite of the most careful suture there is often secondary thrombosis. The vessel walls are not normal, but have undergone pathological changes and so the blood coagulates more readily. For this reason circular suture should be performed only when it is absolutely necessary in order to supply the peripheral parts with blood. In cases two to three months old the ligation of the vessels is not nearly so dangerous as in recent cases. The conditions are similar in arteriovenous aneurisms. In these cases the peripheral end of the artery is often nearly atrophied on account of the almost complete passage of the blood stream through the collaterals. Suture is unnecessary in small arteries and is directly contra-indicated in infected aneurisms which offer a poor prognosis at best. A GOSS.

POISONS

Mouchet, A.: Chronic Recurrent Tetanus. *Med. Press. & Circ.*, 1916, ci, 28.

Chronic recurrent tetanus is a rare disease but its recognition is very important in order to determine the correct treatment. The case reported was that of a soldier wounded in the supraspinous fossa by a shell fragment. The man developed tetanus and was treated with morphine and chloral in massive doses. He recovered but after several weeks the symptoms recurred. X-ray examination showed a fragment of shell beneath the scapula. Operation revealed the fragment and a piece of clothing. Recovery followed their removal.

The important points to learn from this case are three: (1) injection of antitetanic serum in every case with a wound; (2) free opening of the wound; (3) thorough extraction of all foreign bodies.

J. H. SKILES.

Oppenheimer, L. S.: Treatment of Tetanus. *Internat. J. Surg.*, 1916, xxviii, 409.

The author reviews the classical treatment of tetanus which today is practically limited to the

use of prophylaxis, magnesium sulphate, phenol, antitetanic serum, chloretone, and chloral hydrate.

The principal factor in producing death is the rapid and terrible exhaustion due to the muscular contractions, and not the toxæmia nor the neurotoxins; therefore the convulsions should be controlled and the patient's strength maintained while the toxins diminish. By so doing many patients can be saved. Prompt prophylactic treatment, early administration of antitetanic serum, chloretone, and chloral hydrate are all very valuable. The last mentioned should be given in large doses.

HENRY J. VAN DEN BERG.

SURGICAL THERAPEUTICS

Fraser, J.: Value of Hypochlorous Acid in Treatment of Gas Gangrene. *Brit. M. J.*, 1915, ii, 525.

The usual cause of gas gangrene is the bacillus aerogenes capsulatus along with the streptococcus. The usual location of the wound is in one of the lower extremities. The author has never seen a case of gas infection in a wound of the scalp or face, and only on one occasion has he seen gas infection in a wound of the trunk. The lower extremity is more frequently involved than the upper, especially below the knee.

The infection pre-eminently occurs in a puncture wound, and more especially in a wound which has been associated with extensive extravasation of blood into the tissues. From the wound opening a scanty, foul-smelling discharge appears; it is largely composed of broken down blood-clot; it is of a brownish color, and mixed with it there are bubbles of gas. The skin around the wound becomes of a faint purplish color. In the subcutaneous tissues there is an accumulation of lymphlike fluid. There is a similar infiltration throughout the intermuscular septa and connective-tissue planes, The muscular tissue rapidly loses its healthy red appearance; it becomes pallid and avascular, and disintegrates into a foul-smelling necrotic mass; it is always extensively infiltrated with gas; if the muscle is exposed to the air it becomes dry, brown, and leatherlike.

The general aspects are the phenomena of fever: rapid pulse, increased respiration, restlessness, sweating, delirium, unconsciousness, and death. Ultimate death would appear to depend upon the structural changes which are found in the brain, the suprarenals, and the liver.

The method of treatment used by the author is the application of a 0.5 per cent solution of hyperchlorous acid (known as ensol), occasionally intermitted with one or two other procedures, the application of the powder known as enpad (bleaching powder and boric acid) and the use of baths of hypertonic salt solution. The method of preparing ensol is as follows: 27 grams of dry bleaching powder is added to one liter of water, the mixture shaken, and 27 grams of boric acid then added, the whole is then thoroughly shaken, allowed to stand a few hours, and then filtered through cotton wool. The clear solution is ensol. It is slightly alkaline to litmus and contains approximately 0.5 per cent hypochlorous acid. Enpad was made by finely grinding the dry bleaching powder and adding an equal quantity of boric acid powder.

Whenever a case of gas gangrene was recognized as such the ensol treatment was immediately begun. The local wound from which the infection had apparently commenced was opened up thoroughly, and as far as possible all free blood-clot was removed. Whenever an emphysematous sensation could be detected an incision about two inches long was made. Each wound was then thoroughly irrigated with ensol, and if the wound was of any depth irrigation was carried out under considerable pressure by means of a Higginson syringe.

Grossly infected muscle or skin was cut away. Gauze soaked in ensol was lightly packed into all the crevices. Drainage tubes with lateral openings for injecting ensol were used in large wounds. Dressings moistened with ensol were placed over the wound and were changed at from four to six-hour intervals.

After three to four days' treatment the wound was usually free from foul odor. Sloughing soon occurred and healthy granulation formed in the wound. Enpad was used as a dusting powder in addition to the above treatment, beginning the fourth day. On the seventh and subsequent days, until granulation was complete, the treatment was further modified by immersing the part for four hours each day in a bath of hypertonic salt solution.

Observations of the wound from day to day showed some interesting features. During the first twenty-four hours the foul smell of the wound entirely disappeared; the discharge as such entirely disappeared and was replaced by a lymphlike secretion. After the third day this lymphlike discharge tended to cease and granulation tissue began to form. Sloughs separated with extraordinary rapidity and the healthy granulation tissue which remained completed the process of healing.

Details of a very interesting series of cases are added.

J. H. SKILES.

SURGICAL ANATOMY

Mayo, C. H.: Errors in Anatomical Development; Their Cause and Surgical Significance. *Surg., Gynec. & Obst.*, 1916, xxii, 11.

The change of the invertebrate to the vertebrate not only concerns the nervous system but is just as important in the intestinal system and in the organs of nutrition and elimination. Anomalies of these structures which represent the superiority of the vertebrate are fraught with the most serious consequences.

All progress has been identified by such changes in the predominant species of any period which has enabled them to live in a different medium and to be sustained by different nutrition.

In a consideration of the causes of errors of development it is useless to study the changes in vertebrates alone, as during one-third of the period of gestation the vertebrates are almost alike in their development. Consequently such a study forces the student back to a consideration of invertebrate life.

In the higher invertebrates, such as the limulus, the peculiarity of development was a single straight gut connected with a cephalic stomach. The peculiarity of the nervous system, however, was such that it grew over the cephalic stomach exactly to conform with the growth of the nervous system over the ventricles of the vertebrate brain. Between the collections of nerve-tissue on the cephalic stomach are placed masses of digestive glands which resemble the cells of the liver and pancreas.

The invertebrate has a nervous system in front of the intestine, while the vertebrate is characterized by having the intestinal system in front of the nervous system.

If one considers the structure of the nervous system and its ventricles, the central or neural canal and its terminus in the first period of gestation, he will find that it is almost exactly like the cephalic stomach and straight gut of the invertebrate.

The gullet of the invertebrate disappeared within the skull, taking with it the pituitary gland, the area thus vacated being marked in embryonic life by a pharyngeal depression called "Rathka's pouch."

The pituitary did not develop from the infundibulum as it exists in the same position on the œsophagus of the invertebrate. In the region of the infundibulum and of the hypophysis, because of developmental change or reversion, theoretically should be found the same types of tumors, that is, dermoids, cysts, and teratomata, as are found at the caudal extremity of the neural canal which has also lost its opening.

By such change the cephalic stomach and straight gut disappeared to become the ventricles of the brain and neural canal, which necessitated the ventral development of an intestinal system and the upward and backward growth of the segmented nervous system surrounding the spinal canal.

The cerebrospinal fluid is formed as a secretion of the choroid plexus and is found filling the ventricles and neural canal in the third month of the human embryo, which shows the period of the closure of these spaces.

An increase in the tension of the cerebrospinal fluid may be caused by loss of equilibrium between production and absorption of fluid as in hydrocephalus spina bifida. Maldevelopment may arise from changes in the mineral salts and from anything which interferes with the germ, the egg, or its development. Along these lines are explained cranial and spinal defects and club-feet, dermoids and teratomata, bladder and rectal anomalies from cloacal forms.

RADIOLOGY

Hvitz and Callot: Radioscopic Localization by Means of a Screen Perforated with a Lead Thread (Localization radioscopique par la méthode de "l'écran percé avec fil à plomb"). *J. de radiol.*, 1915, p. 709.

The authors give the details of a modification of the fluorescent screen for which they claim greater accuracy than is usually obtained in the localization of foreign bodies. This is accomplished principally by a small orifice made in the screen through which a lead thread passes, kept to the vertical by a plumb weight. By manipulation of movement of the screen the exact depth of the foreign body position can be ascertained. The authors claim that in their apparatus several direct measurements, which must be taken in other apparatus and which are liable to lead to error, may be omitted, viz., the distance of the anticathode from the screen; the displacement of the ampulla with or without angle of deviation; the distance of the two radioscopic images of the foreign body; the distance of the screen from the skin. Dispensing with this unnecessary procedure renders their method more rapid. Under good conditions they claim that the variation in the actual position of the foreign body from its calculated position is not greater than a few millimeters. A. Goss.

Aubourg and Barrett: One Year's Work of Two Radiologic Wagons (Une année de fonctionnement des deux camions radiologiques de la armée). *J. de radiol.*, 1916, p. 699.

The communication made by these authors will be of particular interest to army surgeons or to those engaged in the organization of the medical and surgical service of armies or units for field service. Although the Balkan and Russo-Japanese wars furnish some data of interest, yet now for the first time has the radiologic equipment and details of operation in connection with actual war conditions been worked out on a systematic basis. The authors give a very detailed account of two of the movable units fitted for service at the front. Particulars are described under the headings: (1) radiologic equipment of automobile wagons, inclusive of personnel: (2) the use of the equipment in the field with the regulated methods of procedure. This systematic organization has resulted from the practical conditions forced by the war, which could not be determined beforehand. A. Goss.

MILITARY SURGERY

Lévy, L., and Plisson, L.: Infectious Complications of War Injuries (Considérations sur quelques complications infectieuses des blessures de guerre). *Lyon chir.*, 1915, xii, 602.

The authors discuss tetanus and gas infection, and from the incidence of these two infections at the beginning of the war compared with that at present they conclude that, though the prognosis after they

have once developed is very grave, they are both preventable conditions. Tetanus has been practically controlled by the systematic use of antitoxin, and gas infection very materially diminished by early and complete surgical treatment of all wounds, exposure of all recesses to the air, and thorough irrigation of the exposed surfaces with hydrogen peroxide and ether. This treatment must be given early to be effective so that the question of preventing gas gangrene becomes really one of providing the most comfortable and rapid means of transportation for the wounded to a point where they can be operated upon in safety.

The authors believe that several varieties of bacteria may cause gas infection, and that the bacillus perfringens is responsible for many cases. They think it possible that in the future the surgical treatment may be supplemented by an antiperfringens vaccine and they are working on such a vaccine. In addition to the antitoxin in tetanus, they suggest the use of nucleinate of soda to increase the leucocytosis and thus the defensive power of the body. A. Goss.

Kaiser, F. J.: Neuralgia After Gunshot Injuries (Ueber Neuralgien nach Schussverletzungen). *Beitr. z. klin. Chir.*, 1915, xcviii, 256.

Kaiser gives the histories of 6 cases of neuralgia after gunshot injuries of the limbs. Four of the cases were in the median and two in the sciatic. In all of the cases except one there was a mixture of neuralgia and neuritis. One was a pure neuralgia. The neuralgia generally begins a few days after the injury and proceeds slowly without any thickening of the nerve and without any trophic disturbances of the skin. The neuritis begins immediately after the injury and disappears sooner than the neuralgia. The inflammation is generally only perineuritic and does not cause interruption and destruction of conducting nerve-fibers.

The treatment is tedious and consists of hot air, hot baths, massage, and electricity. Good results were obtained from the injection of one per cent novocaine and adrenalin followed by massage; injection of fibrolysin into the scar was also of value. When these methods were not effective (2 cases) the nerve was laid bare, freed from cicatricial tissue, and sheathed in a flap of muscle. Stoffel has recently published an article showing the positions of the limbs in which the nerves are under tension and in which they are relaxed. In these cases the limbs were held in the characteristic positions for relaxation of the nerves. A. Goss.

Sackur: Gas Phlegmons in War Injuries (Die Gasphlegmone bei Kriegsverwundeten). *Med. Klin.*, Berl., 1915, xi, 1022, 1046.

The author gives a good review of the pathology of gas phlegmon, and also describes some of his own experiences with it in the past few months, as a surgeon in one of the large hospitals of the western front, where he has had many cases of gas phlegmon.

With reference to the etiology it is worthy of note that there is a great increase in the incidence of gas phlegmon in rainy seasons, because the wounds get more soiled by the wet earth. The lower extremities are much more frequently involved, because of course the clothing that covers them is much more soiled with mud than the clothing of the rest of the body. Gas phlegmon is very exceptional about the face and head.

Further study is necessary in order to determine the connection between gas phlegmon and thrombosis of the blood-vessels, but at any rate interference with the circulation predisposes to outbreaks of this wound infection. The diagnosis is not difficult in typical cases; in doubtful cases roentgenograms furnish a reliable method of diagnosis. The marked extension of the local process toward the distal part of the limb is probably explained by the fact that the interference with the circulation is greater in the part of the limb on the peripheral side of the wound than in the central part of it. The region of the body in which the phlegmon is found plays quite a part in the prognosis. Sackur lost the majority of cases where the buttocks were involved.

The treatment is free incision and if necessary amputation. Sackur does not believe that Bier's hyperæmia is justified in the treatment of gas phlegmon of the extremities, because it is not free from danger. A. Goss.

Fauntleroy, A. M.: Gas Bacillus Infection. *Ann. Surg.*, Phila., 1916, lxiii, 1.

The author gives a summary of knowledge gained during the present war relative to gas bacillus infection.

As a result of careful bacteriological studies laboratory men have identified the bacillus perfringens as a strain of the Welch organism and men of large experience are practically unanimous in pronouncing them identical.

The organism flourishes in the soil and is found in all localities where the present trench warfare is being conducted. The organism thrives best in the presence of necrotic material.

A fatal case of gas infection passes through successive stages; i.e., injury, infection, localized tissue necrosis, progressive gas production, circulatory disturbance, increased virulence, and septicæmia. By timely treatment the process may be arrested and eventually cured.

The pathology includes: (1) extensive destruction of tissue adjacent to the wound; (2) marked parenchymatous degeneration of muscles above and below the wound; (3) the toxins seem to have a selective affinity for fascial planes, producing greater destruction of them than of the adjacent muscles; the outer walls of the blood-vessels are acted upon by the toxins, thus we have the extravasation of blood seen beneath the skin.

The characteristics of the wound in gas bacillus infection are as follows:

After two to five days there is a swelling and gas forms in the tissues; there is an induration of the skin; there is a slowly, progressive brownish discoloration of the skin and adjacent tissue; a fœtid odor is characteristic of the serosanguinous discharge from the wound; and there is a more or less sudden appearance of vesicles, which vary in size from a pea to those several inches in diameter. Although a pulse may be felt in one of the arteries distal to the wound during the early stages of the infection it becomes progressively weaker and in the last stage it is always absent.

The fluid in the vesicles rarely contains the organism. In all fatal cases the heart, large blood-vessels, and the brain contain large numbers of gas bubbles.

Injuries of sufficient severity to predispose to gas infection are usually associated with more or less shock, evidences of sapræmia, and in from ten to thirty hours after the injury manifestations of the specific invasion are apparent; there is a rise of temperature of 1 or 2°, rise of pulse-rate, headache, malaise, anorexia, and thirst. This is succeeded by the second stage; namely, progressive gas formation, circulatory disturbances, and increased virulence. The pulse-rate increases out of proportion to the rise in temperature. The temperature may reach 104 or 105° F. The discharge from the wound increases, the part swells, crackling in the tissues is very marked, there is mottling of the skin, the constitutional symptoms increase in virulence until the patient passes into a fitful coma-like condition which heralds the final grade which is septicæmia. In this stage there is a falling of the temperature curve and a rising pulse-rate.

The prognosis is dependent on the location of the wound, wounds of the extremity being more often the source of this infection; the amount of pulpified tissue; the length of time elapsing between the injury and the institution of proper surgical measures.

The treatment is divided into prophylactic, abortive, and curative.

Under the first head are included proper training in personal hygiene; the proper construction of trenches, with a view of diminishing the possibility of soil contamination; and proper first-aid treatment, which should consist in the liberal use of iodine.

Abortive treatment should be begun within 12 hours.

Mechanical measures consist in the removal of foreign bodies and ragged tissues, and the continuous application of antiseptic agents which will kill organisms as well as cause a detachment of devitalized tissues. Dakin's fluid is such an agent. Subcutaneous injection of oxygen has been tried and found to have little or no influence on the infection.

The indications for amputation are largely a matter of surgical judgment and experience.

ISIDORE COHN.

Holcomb, R. C.: First-Aid in the Navy. *Maryland M. J.*, 1916, lix, 8.

Distinction is made between emergency surgery administered by a trained physician, and first aid administered only as a temporary expedient by unprofessional or untrained persons.

In the large naval yards and manufacturing plants one or more medical officers are in constant attendance, and the first-aid package is not needed.

In war time the army is a mobile organization and the situation is entirely different. The delay in getting the patient to the surgeon and the environment inviting infection makes the opportunity for practicing aseptic surgery rare. The surgery of trench warfare is of much interest to the naval surgeon, as more than one-tenth of our medical corps is in the field service today.

Holcomb calls attention to the necessity of having different first-aid packages for different branches of the service. Those for use where injury is apt to be from small arms differ from those to be used where wounds occur from shells, or from flying fragments of steel as on shipboard, or from injuries apt to be sustained by aviators, where burns and fractures are common.

The packet issued to landing parties is small, covered by an impervious container; it consists of two compresses, each sewed to a bandage so they will not drop off in handling, one for the wound of entrance the other for the wound of exit.

Instructions in emergency first-aid treatment are given to every man and officer in the navy. This course of instruction is uniform and consists of five periods, in which are covered the demonstrating and applying the contents of the first-aid packet, shell wound dressing, treatment of broken bones, and extemporaneous methods of immobilization, treatment of wounds in general. The instructions cover not only what may be done, but in certain wounds, as of the chest and abdomen, some of the things that should not be done; also methods for controlling haemorrhages and the resuscitation of the apparently drowned. Certain selected groups are further instructed as to transportation of the wounded to the dressing stations.

D. L. DESPARD.

Frank, J.: The Fate of Our Wounded in the Next War. *Chicago M. Recorder*, 1915, xxxviii, 20.

Frank, Surgeon-General of the state of Illinois, and a member of the Medical Reserve Corps of the Army, accompanied Field Hospital Co. No. 1 and Ambulance Co. No. 1., U. S. A., on a march from Fort D. A. Russell, Wyoming, to North Platte, Nebraska, a distance of 242 miles covered in 14 marching days, and thence by rail to the sanitary instruction camp at Sparta, Wisconsin, where he remained a few days to complete his observations.

The report of the trip affords an insight into the history, organization, equipment, and training of mobile sanitary units for field service. The reader is further familiarized with life on the march, in camp, with cantonment hospitals, and the utiliza-

tion of such material as the service affords to make the existence of surgeons, attendants, and patients possible in a campaign.

Frank pays high tribute to the skill of the medical officers of the army as sanitarians, as organizers, as disciplinarians, as tacticians, and as physicians and surgeons, and proposes the question, "What will become of our wounded in our next war, considering that many volunteers will have to be depended on for a future campaign?" He points out the present deficiency of sanitary units in the National Guard and the limited training accorded them in times of peace. Professional skill alone will not be sufficient to enable surgeons to lead such units as field hospitals and ambulance companies to useful activity in the event of war. He points out the need of prolonged training in the field under warlike conditions and proposes that the present annual state guard encampments, lasting about a week, be abolished and long marches with repeated field exercises be adopted in their stead. Even with the limited funds now available money is not the sole question, since with the avoidance of railroad transportation fixed camps will be saved. Only such training will fit medical officers of the National Guard for handling the wounded under their care in an effective manner both for the benefit of the sufferers and the army as well.

In an appendix entitled "Technical Notes" Frank contributes valuable data on the Medical Reserve Corps, as to the disposal of waste in camp, certain appliances for the transportation of wounded, inexpensive improvised "fireless cookers" to provide hot food and drinks for patients and exhausted soldiers at a moment's notice. He also discusses the proposed new field belts, the pockets of which contain certain medicines, drugs, and instruments with which first aid can be administered and lives saved on the battlefield. The old method of having an orderly carry a large bag or pouch slung over the shoulder is condemned as unreliable and clumsy.

Zuckerkandl, O.: Treatment of Wounds in War (Ueber Wundbehandlung im Kriege). *Deutsche med. Wchnschr.*, 1915, xli, 1505.

Before the war the general agreement was that wounds should simply be covered with an aseptic dressing and treated as conservatively as possible. This view was largely due to the bad results of active wound treatment in the pre-antiseptic era. Riedel says that he believes too much operating was done in 1870–71 and too little in 1914–15.

If the aseptic dressing is as important as it is generally held to be the wounds should not be infected, or at least only slightly infected. Unfortunately this is not true. The great majority of them are primarily infected, so a more active treatment than simple aseptic dressing becomes necessary. Yet it is quite true that the substitution of antiseptic for aseptic dressings has not had much effect. The reason for this is that antiseptics must be applied almost immediately after the wound is made if they are to be effective; moreover as applied on the field they do not reach all the recesses of the wound. The most rational treatment therefore seems to be to apply an aseptic first dressing and get the wounded into the hands of a surgeon as quickly as possible; then the wounds should be opened up, incised freely, and drained. Mechanical disinfection seems to be much more effective than chemical. Of course the earlier this surgical treatment is given the better its results.

Early operative treatment is especially necessary in wounds of the skull and joints, and a number of illustrative cases are described. A. Goss.

Gray, H. M. W.: General Treatment of Infected Gunshot Wounds. *Brit. M. J.*, 1916, i, 1.

The author states that since the early part of the war it has been generally acknowledged that antiseptics have proven ineffectual, both as preventive or disinfecting agents in badly infected, lacerated wounds. He says that regardless of the type of antiseptic used, most wounds ran a fairly definite course, the length of which depended mainly upon the patient's resistance, and that these resisting agencies of the patient's own body are more effective in dealing with the local infection than any antiseptic solution, powder, or paste.

He states that it has been proven to the satisfaction of the surgeons working in his particular area, that the use of salt solutions is of far greater importance than antiseptics, and that the addition of antiseptics to the salt solution has not yet proved of any advantage, with the exception that in some instances they act as effectual deodorants.

He cites the following general considerations governing the use of salt solutions:

1. The solution must be brought into contact with every infected part of the wound.

2. Hypertonic solutions stimulate a more or less profuse flow of lymph containing antibodies, and thus bring about what has been called "lymph lavage" of the tissues lining the wound.

3. Isotonic or physiological salt solution stimulates diapedesis, that is to say, it brings about a concentration of leucocytes in these tissues. These phagocytes are in large measure shed into the wound cavity and form pus corpuscles.

4. The micro-organisms causing the infection make their way into the tissues lining the wound in a few hours. The rapidity and depth of penetration vary according to the kind of organism, the amount of devitalization of the tissues, and the method of treatment.

5. The infective material is carried by the missile into the depths of the wound; any superficial treatment is therefore of no practical benefit, except in preventing fresh infection.

6. The presence of effused fluids, whether blood or lymph, of foreign bodies, and of badly lacerated or necrotic tissues, favors the rapid growth of organisms in the wound and hinders their expulsion from it.

7. Wounds deteriorate in condition, and inflammation may become rampant, especially during transport, if the wounded part be not properly fixed and supported, even though no fracture be present.

8. A patient whose vitality is very low, owing to the severity both of the wound and of the sepsis, is unlikely to fight serious infection successfully and to survive a conservative operation and the strain which after-treatment involves. The question of amputation must therefore occupy a far more prominent place in the mind of the surgeon than it does in civil practice.

9. The method of treatment must therefore vary according to the nature of the chief infecting organisms, the physical character of the wound, the general condition of the patient, and according to whether or not he is to be transported within a short time.

He speaks of the great importance of free incision of infected wounds and emphasizes the significance of the thorough cleansing of the wound and the advantage of fixation of the wounded parts.

As regards drainage, he states that if the dead space is not large and can be obliterated by suitable bandaging, if the effusion is likely to be small in amount, and if the wounded part has been rendered aseptic there is really no necessity for drainage; and in cases where drains are used they should be put down to, but not into, the wound. The most interesting observation is in reference to the use of what is called the "tablet and gauze" pack. This consists of gauze packed fairly firmly into the wound, numerous tablets of salt being placed between the folds of the gauze. The gauze should be packed in concertina-wise, a tablet being placed between every third or fourth fold. A fairly large, fenestrated rubber tube is placed so as to reach to the deepest part of the main cavity, which is then filled with gauze and tablets. The dressing is made flush with the skin and the tube projects slightly from its midst. The surrounding skin is painted with a solution of iodine or other antiseptic application. Two or three layers of gauze are then used to cover the wound and surrounding skin. A suitable amount of absorbent cotton-wool is applied and a bandage wound on smoothly and firmly.

The superficial dressings are the only ones that are changed frequently, and they only when they become soaked with discharge. He says this tablet and gauze pack may be left in for many days, in some instances it has not been removed for fourteen days. After the first twenty-four hours or so, it often keeps remarkably dry. Usually in six to eight days the pack is removed, preferably under an anæsthetic.

The use of saline hypertonic salt solutions is supported by a summary of replies which the author received from questions sent to 22 hospitals. It was the unanimous opinion that treatment of wounds by hypertonic saline solution was more satisfactory than any other method used.

At the time the letters were sent out, baths were apparently preferred, a warm 5 per cent solution of ordinary table salt being used. Continuous irrigation was mostly used after flapless amputations. Hot fomentations of 5 to 10 per cent saline were strongly recommended. For the deep wounds the tablet and gauze packs were judged to be the best.

D. C. Balfour.

Sehrt, E.: Passive Hyperæmia in the Treatment of Severe Grenade and Shrapnel Injuries (Die Stauungsbehandlung schwerer Granat- und Schrapnellverletzungen). *Muenchen. med. Wchnschr.*, 1915, xlii, 1260.

Sehrt describes his treatment of 73 cases of severe injury by means of passive hyperæmia. Rubber bandages were put on far enough beyond the wound so that there was a zone of healthy tissue between the wound and the bandage. They were left on 6 or 7, or even in some cases 12, days. They were put on without any previous treatment of the wounds, which were simply covered with sterile gauze loosely bandaged on. The dressings were not changed till the time to remove the bandages, even though in some cases flies or maggots had entered the wounds. The high fever which was present in the grenade injuries fell gradually to normal, the pain stopped soon after the application of the bandages, and a great quantity of secretion was discharged from the wound; the tissues around the wound showed no œdema when the bandages were removed.

Sehrt believes that this passive hyperæmia prevents the general involvement of the organism in the infection more effectually than any other method of treatment. It seems especially valuable immediately after the injury until the organism has gained time to wall off the infection with granulation tissue. The results of the treatment were particularly striking in gunshot injuries of the large joints, even when suppurative inflammation had already begun, and its value was shown especially in the maintenance of function and the avoidance of ankylosis. It also seems to limit severe gas phlegmons, and to put a stop to the extension of the process.

A. Goss.

Winn, D. F.: Statistical Report of Cases Treated in the American Red Cross Hospital, Kiev, Russia. *Mil. Surgeon*, 1916, xxxviii, 56.

Winn reports his work during eight months at Kiev. Tetanus and gas infection were very prevalent, especially after the snow melted, when soil contamination was at its maximum. The Russian army uses no prophylactic serum, for two reasons: (1) difficulty in getting the serum from the only open market—America; (2) lack of appreciation of its value.

The following excerpt from the author's report is very illuminating as to the inefficiency of the Russian Medical Department: "On account of the close-range fighting, mutilating wounds were the rule;

we saw few of the so-called 'humane-bullet' wounds. Most of the fractures of the arm and leg were literally bathed in pus at the time they reached us. At the first dressing at the front, plaster or starch casts were applied and the cast marked with the date of application and whether clean or infected. Frequently there was no mark to show the locality of the wounds. No windows were cut. Therefore, many of these men went from four to eight days without a dressing, since that was the average time required to transport them to Kiev. The result was that the original dressing corked up the wound, the pus burrowed about among the muscles, and the patient got an extensive cellulitis and the full benefit of the accumulating toxins."

Another interesting comment Winn makes is that bullet wounds were more numerous than wounds caused by shrapnel, shell casing, etc., thus showing that the character of warfare on the eastern front differs materially from that on the western.

W. M. BOOTHBY.

MEDICOLEGAL

Kennedy, J. W.: Our Legal Handicaps. *Med. Council*, 1916, xxi, 57.

The author expresses his belief that if members of the profession were afforded sufficient protection and were permitted to exercise their medical and surgical privileges, the mortality would be less than one-third of 1 per cent in abdominal surgery, while the mortality in abdominal surgery throughout the country now ranges from 2 to 10 per cent. This disparity is due to human errors, and the state legislatures are largely responsible.

The slothful practitioner who causes an occasional death should be handled by the profession and brought into more progressive thinking. Kennedy most bitterly resents the present state laws which legalize and countenance the most perverted and inconsistent ruling when it comes to making laws which deal with health. He resents the fact that a legislative body endorses those means which prevent the execution of professional rights and the use of knowledge which is definitely life-saving. He contends that the law has no right to exact a standard of one class of men and then place in competition with them individuals who have not qualified as practitioners of medicine and who are the means of keeping the patient from proper treatment until too late.

He maintains that if a professional monopoly could be obtained by men of the highest ideals and standards of scientific attainments then there would be a monopoly with a soul which would be truly life-saving to the extent of scientific qualification and attainment becoming to the era in which we live.

He resents the present state of affairs most of all because a lamentable number of the profession have sacrificed their lives to advance the calling only to have the work thwarted by a body of misinformed men which prevents us from the maintenance of the magnificent heritage which those distinguished deceased gave us. In conclusion the author states: "It may not be a comfort to the weary practitioner or the fatigued specialist to know that we are only an unimportant rear guard to those mighty men who are at the front and are the true heretics in the progress of our profession, but it is to these leaders our professional hat must be ever raised. Therefore, to sum up the first great cause of death-rate, as I have seen it, is that 45 per cent of our deaths are due to human non-professional errors which come from an unjust legislature which demands ideals and in the next act takes from us the opportunity to attain those ideals."

EDWARD L. CORNELL.

GYNECOLOGY

UTERUS

Balfour, D. C.: The Relative Merits of Operations for Cancer of the Uterus. *Surg., Gynec. & Obst.*, 1916, xxii, 74.

The author's observations are summarized as follows:

The best operation for cancer of the uterus is the one which permits the widest extirpation of the disease commensurate with the lowest possible operative mortality, and the minimization of immediate and late complications. Unfortunately, no one operation has proved so satisfactory, either in primary or ultimate results, as to leave the treatment of cancer of the uterus on a settled basis. Certain peculiar features of cancer of the uterus and of the cervix particularly, in relation to symptomatology, variability in malignancy, and the rôle played by infection render important the intelligent utilization of every known means to combat the disease.

It is well known that with cancer in any part of the body secondary infection is an important factor in the spread of the disease, and consequently in the immediate and end-results of the operation. Malignant disease of the cervix is a good example of this septic type of cancer, statistics showing that in 40 per cent of individuals dying from cervical cancer no evidence of metastasis is found.

Much of the pessimism in regard to the earlier history of operations for cancer of the cervix was due to the fact that the disease was often disseminated as a direct result of traumatism at operation, not only through the vascular system and the lymphatics but by transplantation to the operative wound. Autogenous grafting as the result of mechanical injury is an important cause of recurrence and is frequently observed in cancer in various situations.

The cancer when situated in the cervix is first destroyed by the cautery and then a dissection made with the Paquelin cautery knife through the vagina and perimetric tissues, the separation of the bladder by gauze dissection being the only part of the operation which is not done with the cautery. If the fundus of the uterus is drawn out anteriorly before clamps are placed and the clamps applied from above down, injuries to the bladder and ureter do not occur. After removing the uterus in this manner, the tissues in the bite of the clamps and the clamps themselves are thoroughly heated. The clamps are left on forty-eight hours and unlocked at least ten hours before removal. The iodoform gauze which has been packed lightly into the space between the clamps is left undisturbed for six or seven days. This operation has given as good results under similar conditions as have been obtained from total abdominal hysterectomy, and with a lower operative mortality. It is especially applicable to elderly and obese patients who are poor surgical risks.

The author became interested in the Percy method about two years ago and from experience in more than one hundred cases is convinced of its great value. Its essential and advantageous features are: (1) the slow heating process; (2) the abdomen always open; (3) the gloved hand of an assistant in the abdomen indicating the effectiveness of the heating process; and (4) the water-cooled speculum. The method undoubtedly offers more to the patient with advanced cancer of the cervix than any treatment with which we are familiar. Its value is so definite in the advanced stages that serious consideration must be given its possibilities in the earlier stages of the disease. Recently, in several cases of advanced cancer of the cervix, the author has accompanied the Percy treatment by ligation of both internal iliacs.

The ultimate benefits of this interesting procedure cannot yet be foretold. Attention should be drawn to the fact that in stretching the vaginal tissues in order to use large specula secondary carcinomatous nodules may develop in the vagina and about the vulva.

The conclusions reached are as follows:

1. Patients with cancer of the cervix not too far advanced and who are good surgical risks should be treated by thorough cautery sterilization of the local disease in the cervix and total abdominal hysterectomy of the Wertheim type.

2. When cancer is confined to the cervix, the vaginal outlet fairly lax, and the patient a poor surgical risk, i.e., obese, with cardiorenal disease, etc., the preferred treatment is the clamp and cautery vaginal hysterectomy.

3. In the more advanced stages of the disease if the patient is a good surgical risk the two-stage operation should be done; i.e., the Percy method of tissue coagulation by heat followed after some weeks by total abdominal hysterectomy. If the patient is a poor surgical risk the Percy method should be applied but the abdominal hysterectomy should be considered in the individual case on its merits.

4. In most instances in cancer of the body of the uterus a total abdominal hysterectomy should be done. In the small minority of patients with cancer of the body of the uterus and who are poor surgical risks clamp and cautery vaginal hysterectomy may be indicated.

Percy, J. F.: Heat in the Treatment of Carcinoma of the Uterus. *Surg., Gynec. & Obst.*, 1916, xxii, 77.

It seems necessary to emphasize the fact that the correct application of heat in uterine carcinoma is not a cautery operation. Of the advanced cases 90 per cent are operable by the application of low degrees of heat. The results in this otherwise hopeless type of cases are sometimes surprisingly good. This is especially true if there are no secondary degenerative changes in the kidneys, liver, and heart.

For the purpose of statistics Percy insists that very advanced cases of uterine carcinoma should be classed with the palliative operations only. The heat method is the only one by which a gross mass of cancer can be destroyed. This results in an immediate improvement of the patient physically. Metastasis is weakened and if local recurrence develops, it is much less active. When convalescence is well established the heat treatment should be followed by repeated massive doses of X-ray through the Coolidge tube. He also insists upon the great value of his technique in converting a borderline inoperable case into one that is safely operable. In cases in the first and second stages, the author believes he is warranted in saying that 70 per cent will be found free from recurrence five years after one application of the low degree of heat.

Percy deprecates the use of the cold steel knife in any form of cancer, in any stage of development, and in any part of the body where the hot knife could just as well be used. The use of the knife and the curette, and active manipulation of the cancer-infected organ during hysterectomies are the most potent measures for encouraging a recurrence of the growth. The heat treatment inhibits dissemination, and manipulation of the mass is not necessary.

The low heat should be maintained until all the pelvic structures fixed at the beginning of the application are freely movable. To do less than this must, of necessity, defeat the object of the treatment which is the complete penetration by heat of all the cancer-infected area possible.

Boldt, H. J.: High Degrees of Heat vs. Low Degrees of Heat as Palliative Treatment for Advanced Cases of Carcinoma of the Uterus. *Am. J. Obst.*, N. Y., 1916, lxxiii, 1.

The author gives a general discussion of the advantages of the two methods and reports a case, with complete autopsy findings and tissue study, which was treated with the low degree of heat as advised by Percy. While he admits that one case is usually not conclusive this record is of unusual value. He believes that the results of Percy's experimentation fall to the ground, since his work was done on dead tissue (beef), while his own deductions rest upon the action of heat on living tissue. He believes that his case shows with uncontrovertible positiveness the fallacy of believing that the effect of heat applied in low degrees (so low that desiccation only takes place) and kept in contact with the tissue upon which its detrimental action on cell growth should be exerted over a long period of time, extends for any considerable distance beyond the surface to which the cautery is applied; nor can it exert its destroying effect upon deeper-seated cancer-cells. This extensive action of heat was the belief which he had entertained, and because of this some—particularly Byrne—held that cancer was actually cured by heat, even when past the stage of a radical operation.

The author has used the heat treatment for a large number of cases of advanced carcinoma, but has never seen a case which was actually cured, although many have been made more comfortable and their lives prolonged.

High degrees of heat according to the author are to be preferred to the lower since the operation may be completed in so much less time. The only valid objection to the higher degrees of heat is the smoke and odor that occur during the operation. In extensive work he opens the abdomen so that an assistant may direct the vaginal operator's work. In some cases the internal iliac arteries are ligated, as was first suggested and practiced by the late Pryor. The cauterization is done through a water-cooled speculum.

The use of radium following the final desiccation treatment is commended by the author, since it can do no harm and it may be of much benefit.

C. H. Davis.

Corscaden, J. A.: The Treatment of Uterine Hæmorrhage by the Roentgen Ray. *Am. J. Obst.*, N. Y., 1916, lxxiii, 23.

After a careful discussion of this subject the author draws the following conclusions:

1. The causes of uterine hæmorrhage may be divided into two classes: (1) Those peculiar to the uterus and causing normal or pathological menstruation. (2) Those common to all parts of the body regardless of sex.

2. Menstruation is dependent on the activities of the corpus luteum.

3. Roentgen rays destroy the follicle apparatus of the ovary and thereby automatically bring about a menopause.

4. In the bleeding from the uterus without gross pathological lesion whether accompanied by changes in the endometrium or fibrosis of the arteries or myometrium, production of the menopause constitutes a cure. (1) In women over thirty-seven this menopause is made complete. (2) In women under this age the menopause is incomplete either with a temporary amenorrhœa or merely a lessening of the flow.

5. All myomata which do not constitute an immediate or remote menace aside from that of hæmorrhage are proper subjects for the production of the menopause, provided that ulcerative changes or pedunculated fibroids or polyps do not exist and provided that the possessor be over thirty-seven years of age.

6. All myomata which constitute a menace in women under thirty-eight should be excised rather than subjected to roentgen rays unless operation is contra-indicated.

7. In hæmorrhage from malignant disease roentgen rays are contra-indicated. C. H. DAVIS.

Nyulasy, A. J.: Uterine Displacements. *Surg., Gynec. & Obst.*, 1916, xxii, 105.

The ligaments of the uterus are its primary supports, while the pelvic diaphragm prevents undue stretching of the ligaments under the influence of intra-abdominal pressure.

The cardinal ligaments are the main support, holding the uterus at a more or less definite level in the pelvis. They are musculofibrous bands which pass outward from the side of the uterus and vaginal fornix; beyond the uterer they spread out into fibrous strands inserted into the pelvic wall and other parts, the bladder attachments being very important. The ligaments are exposed by opening up the uterovesical pouch. In prolapsus uteri they may be curtailed by bringing a loop of each onto the anterior uterine surface, and stitching it there (looping the cardinal ligaments).

The round ligaments maintain anteversion of the uterus. Overstretching with retroversion may be remedied by splitting the anterior layer of the broad ligament parallel to the round ligament, closing the opening by a silk purse-string suture (restoration of the round ligaments).

The uterosacral ligaments are tensors of the anterior vaginal wall and vesicovaginal fascia. Their curtailment lessens the cystocele of prolapsus uteri, and in the erect position helps to hold up the dropped organ.

The ideal procedure in retroversion should cause recontraction of the round ligaments. This is achieved by the operation of restoration of the round ligaments, which has been used in 30 cases without relapse.

For slight cases of prolapse an operation for retroversion, with curtailment of the uterosacrals, and six weeks' recumbency is adequate. In pronounced prolapse looping the cardinals, with restoration of the round ligaments is satisfactory, the hypertrophied cervix being excised. The injured pelvic diaphragm is repaired, but cystocele does not usually require interference. In obese breathless females vaginal hysterectomy is safer, but the stumps of the cardinals should be sewed to the vaginal angles.

Boldt, H. J.: Prolapsus of the Uterus. *Intermat. J. Surg.*, 1916, xxix, 13.

Boldt confines prolapsus to those cases in which the entire organ or a part of it protrudes from the vulva. Surgical interference gives the only hope of permanent cure. Avoidance of physical exertion and mechanical support are only palliative measures. Non-healed vaginoperineal lacerations produce descent of the anterior or posterior vaginal wall and are responsible for cases of partial prolapse. In marked prolapse the entire pelvic floor is relaxed. The early getting up after confinement unless complicated by pelvic floor injury has no bearing on uterine prolapse.

Indications as to the kind of operative procedure depend upon whether the patient desires more children or is beyond the childbearing period. Vaginal hysterectomy for prolapsus has no place in this domain of work. During the childbearing period the Gilliam operation combined with plastic work on the pelvic floor is the best for second degree descensus and cures 90 per cent of the cases.

Radical vaginal fixation is the author's operation of choice in cases of marked descensus and in partial or complete prolapsus. This method is known as the Watkins, Schauta, Wertheim, Duehrssen operation. The author cites a hypothetical case with the steps and technique of operative procedure. In patients with complete procidentia of the uterus and vagina, usually old women or widows who do not desire to marry, the author gets absolute and permanent results by total extirpation of the uterus and vagina, columnizing the vaginal tract.

H. G. GARWOOD.

Watkins, T. J.: Prolapse of the Bladder and Uterus. *Lancet.-Clin.*, 1916, cxv, 72.

Prolapse of the bladder and uterus are hernias of these organs. The operative treatment should consist in the following:

1. An advancement operation with or without opening of the peritoneal cavity or vaginal fixation of the round ligaments. This is an advancement of the anterior vaginal wall and bladder upon the cervix or anterior wall of the uterus. The hernial opening is thus closed. It is valuable in cases of moderate amount, especially during the childbearing period. The peritoneal cavity is opened if needed for diagnostic purposes, for plastic surgery upon the ovaries or tubes, or for the purpose of vaginal fixation of the round ligaments, which is done for more extensive cases for retroflexion of the uterus.

2. Transposition of the uterus and bladder. In this operation the relative positions of the uterus and bladder are transposed. This is the ideal operation for the more extensive cases after the menopause. In very extensive cases this operation should be modified by excision of part of the anterior wall of the uterus or of the entire body of the uterus. In excision of part of the uterus the entire uterine mucosa should be excised if the cervix is extensively diseased. The anterior lip of the cervix should generally be excised if a high amputation is not made. In an experience of eighteen years with the transposition operation there has not been to the author's knowledge a single instance of recurrence of cystocele. There have been a few cases of variable amount of recurrence of prolapse of the uterus due, it is believed, to faulty technique. Perineorrhaphy is invariably indicated.

3. Complete excision of the uterine and vaginal mucosa and obliteration of both canals. This operation may be done in very extensive cases of complete prolapse where the patient is willing.

ADNEXAL AND PERIUTERINE CONDITIONS

Corner, G. W.: The Corpus Luteum of Pregnancy as It Is in Swine. *Publication* No. 222, *Carnegie Institution*, Washington, D. C.

Corner has examined 128 pairs of ovaries from pregnant sows. He reviews the various theories as to the origin of the corpus luteum and favors those of Bischoff (1842), and Schroen (1863). That is, he believes that the yellow body is formed either from the epithelial layers of the follicle, the membrana granulosa, or that both follicular layers enter into its formation. He finds that while part of the theca may enter into the formation of the corpus luteum, in the sow, at least, some theca cells remain as distinct cells of special nature in the fully developed corpus luteum.

In pregnancy the cytoplasm of the lutein cell forms two zones, an inner dense one which the author calls endoplasm, and an outer one called exoplasm. This outer zone is full of granules and globules of various substances, giving it a vacuolated appearance, which he regards as evidence of activity and not of senescence. He does not find the yellow pigment granules, carotin, which characterize the corpus luteum of the cow.

Corner describes five periods in the development of the corpus luteum, as follows:

1. Preparation, pregnancy less than 25 days.
2. Height of exoplasmic development, pregnancy from 25 to 30 days.
3. Second part of exoplasmic development, pregnancy from 30 to 40 days.
4. Transition period, pregnancy from 40 to 75 days.
5. Period of endoplasmic development, pregnancy from 75 to 105 days.

The difference between the corpus luteum of pregnancy and that of ovulation is likened to the difference between an army and a mob. The first is in every way more regular and progressive. In ovulation retrogression begins before the corpus luteum is formed, so that the cells vary markedly in size and form, a striking characteristic being a greater infiltration of fat. CAREY CULBERTSON.

EXTERNAL GENITALIA

Smead, L. F.: The Transposition of the Bladder and Uterus for the Cure of Cystocele and Descensus Uteri. *Am. J. Obst.*, N. Y., 1916, lxxiii, 143.

The author draws the following conclusions from his study of this operation:

1. The operation of transposition of the bladder and uterus developed from the operation of vaginal fixation.
2. Vaginal fixation aided the development of vaginal cœliotomy and was directly responsible for vesicofixation of the uterus and vaginal fixation and shortening of the round and uterosacral ligaments.
3. Vaginal fixation has been discarded on account of recurrences and dystocia.
4. The history of the transposition operation really began in 1899, although it was first published by Duehrssen in 1894.
5. It is an operation for the cure of cystocele and incomplete prolapse in women who cannot become pregnant.
6. It is a simple, safe, and effective operation in properly selected cases.
7. The radical freeing of the bladder and its proper care after the operation are essential to success.
8. The operation is applicable in a smaller number of cases than vaginal hysterectomy for prolapse.
9. The shortening of the uterosacral ligaments is an important feature of the operation.
10. The principle of transposition is now applied in several operations including vaginal hysterectomy.

C. H. DAVIS.

Sturmdorf, A.: Tracheloplastic Methods and Results; a Clinical Study Based upon the Physiology of the Mesometrium. *Surg., Gynec. & Obst.*, 1916, xxii, 93.

The functional disturbances revealed in a critical analysis of 128 complete post-operative histories from among 400 cases recorded during the last 20 years indicate that the prevailing convictions as to the uniformity in the beneficent results of established tracheloplastic methods, i.e., trachelorrhaphy and cervix amputation, demand a most radical revision.

The dominating fundamental factor that establishes the morbidity of a cervical lesion is the incidence of infection. Clinically, the course of such infection assumes one of two types: First, as a form of puerperal sepsis with subsidence of its systemic manifestations or, more commonly, it pursues a more or less insidious latent course from the beginning.

The first form usually merges into the second, so that ultimately both eventuate in varying degrees of the same symptom-complex.

The objective and subjective features presented in this chronic stage of the condition are depicted in every textbook, but the nature and significance of the intermediate pathologic phases in the morbid chain that links cause and effect are obscured by a haze of standardized misconceptions.

The functional integrity of any organ depends essentially upon the maintenance of a uniformly normal circulatory equilibrium. This is conspicuously true of the uterus, whose specific activity in menstruation and pregnancy demands a range of local circulatory oscillation that obviously implies the existence of some regulating mechanism.

From time immemorial we have been familiar with the characteristic contractile phenomena manifested by the uterus during pregnancy and labor, nevertheless this identical contractile function as the intrinsic and essential regulator of its normal circulatory balance, remains unrecognized.

It is a perversion of this muscular function, impairing the intensity and rhythm of the uterine contracting cycle, which we must learn to recognize as the underlying morbid link between cervical lesions and their clinical manifestations.

This contention finds its substantiation in the morphology and myodynamics of the myometrium.

In the uterus as elsewhere, every infection incites the greatest reaction in its lymphatic elements.

The uterine lymph current may be traced from its lacunar origin under the endometrium and cervical mucosa, through minute funnel-shaped ostia directly to the myometrium, where it expands into an extensive capillary net, which, utilizing the perimysium as a scaffold, enmeshes every fascicle and bundle of the uterine musculature to its subperitoneal surface.

This arrangement of the lymphatics makes it clear how an infectious process of the cervix inducing an ascending intramuscular lymphangitis may splint and immobilize the elementary muscle bundles by plastic infiltration of their sheaths.

This intramuscular lymphangitis and its resulting impairment of the normal myometrial contractions furnish the pathologic factors that link cervical lesions to their clinical manifestations.

It is an axiomatic surgical principle in the control of any progressive ascending lymphangitis to direct our therapeutic aim at the primary infectious focus.

With the cervical lesion as the portal of infection, trachelorrhaphy should find its cardinal and practically its only sphere early in the puerperium, during which period the "immediate" or "intermediate" operation represents an effort of the highest prophylactic potency.

Early operation purposely or unavoidably omitted and chronic infection ensuing, Emmet's classic trachelorrhaphy as a curative measure presents itself for consideration.

The dominating features of this operation consist of a surgical reproduction of the original tear and its sutural reunion; this at once limits the curative scope of the procedure to cases in which the infection has not extended beyond the borders of the original tear—a rare condition, for we know today that the functional disturbances following cervical lesions, which demand surgical intervention, signalize the infectious invasion of areas beyond the limits of the primary injury and that the conservation of these invaded areas within the cervix perpetuates the morbid process; but a more sinister menace obtrudes itself into this question today; namely, the enhanced cancerous potentialities in the chronically inflamed cervical areas beyond the range of the Emmet operation.

In thus restricting the applicability of trachelorrhaphy to the puerperium, we necessarily augment the range of cervix amputation as the reparative method of choice for all chronic cervical lesions, and it remains to elucidate and obviate those derangements noted as following upon this operation.

Both the cause and prevention of these postoperative disturbances are revealed as inherent in the technique of the prevailing methods of cervix amputation.

The very initial steps in the customary procedure, namely, dilatation and curettage, inflict a useless and most unsurgical traumatism that is not countenanced in any other operative field under similar conditions.

In the next steps, namely, circular ablation of the cervix and suture of its vaginal and endometrial margins, the purpose is frequently defeated by disregarding the physiological and textural features of the cervical elements. For on ablating the cervix in the usual manner, all the muscle stumps are made to terminate at the same level, the longer peripheral fibers contracting to a higher plane than the shorter central fibers tend to pull the vaginal and endometrial margins of the stump asunder; furthermore, the extreme friability of the endometrial edge renders its sutural retention purely transitory, so that, sooner or later, the flaps separate and expose a raw beveled cervical stump.

To fulfill the physiological demands, to meet the pathological indications, and to obviate the technical shortcomings enumerated, a method has been evolved, which has withstood the extensive critical test of results during a period of over three years in public and private service.

The specific features of this procedure effect the complete elimination of the infectious focus by extirpation of the diseased cervical mucosa; preserve the normal arrangement, contour, and functions of the cervical musculature; obviate the mechanical difficulty and secure the permanency of accurate sutural coaptation of flap to stump.

As already emphasized, the dilator and curette are absolutely excluded from the armamentarium for this operation.

The main object in the first step is the formation of an ample mobile cuff of vaginal mucosa; with this in view the outlining incision is carried around the cervix closely skirting the demarcating border between its healthy vaginal sheath and the diseased mucosa, running parallel to the indented line at the lacerated points. The edge of vaginal covering thus outlined is freely mobilized by blunt dissection from its underlying tissues completely around the entire cervix up to the level of the internal os, exposing the circular arteries as for high amputation.

In very extensive lesions it becomes necessary to brush the lower pole of the bladder from its uterine and vaginal attachments for a sufficient distance upwards. The pouting everted cervical mucosa is then circumcised and cored out of its muscular bed as a hollow cone, leaving a raw funnel-shaped cavity. Trimming the loose vaginal cuff

to serve as an accurate lining to the interior of this muscular funnel its retention in this position is secured in the following manner:

Beginning with the anterior segment of the circular flap, a long strand of heavy silk wormgut is passed on its vaginal surface transversely through the free border of its central tip, one-eighth of an inch from the edge, like a mattress suture, the entrance and exit of the strand embracing a quarter inch of tissue. The right free end of the suture is then carried into the cervical cavity to a point just above the internal os, where, piercing all the tissues in a direction forward, upward, and to the right it emerges from the vaginal surface at the base of the flap.

The left free suture end, after reaching the same point above the internal os, passes in forward, upward, and to the left, so that the two free ends, diverging in their transit, reappear on the surface of the anterior vaginal fornix, about one-fourth inch apart, where they are left loose for the time.

The suture course for the posterior flap segment runs parallel to the above, but in a posterior direction, its free ends emerging on the surface of the posterior vaginal fornix.

Now by tightening each individual set of suture ends, the flap segments are drawn into the cervix, lining its whole cavity with vaginal mucosa, the edge of which is thus approximated to the circumference of the internal os where it is retained in apposition as long as desired.

In most cases no further suturing is necessary or desirable, but, should either lateral edge gape, an additional chromic stitch may be introduced. The suture ends are left long to facilitate removal.

For greater ease and control in directing the suture through the cervical tissues, a double curved Peaseley needle should be substituted for the round needle, after engaging the tips of the flap in the first stitch.

A narrow strip of iodoform gauze is introduced with the object of maintaining a flat uniform coaptation of all raw surfaces. This gauze is removed after the fourth day, when the patient is permitted to leave the bed and walk about. The silkworm gut is removed after two weeks, when the loops are found loose and accessible.

MISCELLANEOUS

Leighton, A. P., Jr.: The Use of Luteum Extract in the Treatment of Menstrual Disorders. *Med. Press & Circ.*, 1916, ci, 9.

The author briefly reviews some of the recent ideas regarding the physiology of the corpus luteum and reports his results in the treatment of irregular and painful menstruation by organotherapy. While not ideally successful he regards this treatment as very satisfactory in certain cases. Even better results have been obtained in cases where premature menopause has been brought about by operation. He regards corpus luteum as best indicated in those patients who show severe nervous phenomena such as irritability, malaise and depression, accompanied by headache and scanty menstruation.

In dysmenorrhœa, too, the author has seen some startling results after feeding corpus luteum extract. This has led him to suggest a plausible explanation for the so-called congestive or membranous type of dysmenorrhœa. In addition to acting as a vasodilator of the uterine capillaries, the ovarian hormone has perhaps a further selective action in exciting or stimulating an intracellular or autolytic enzyme in the endometrium, which so softens and digests the histological elements of this tissue that the physiological phenomena of diapedesis, rupture of hæmatomata and exfoliation of mucous membrane are made possible and easy. Where, then, the ovarian hormone is altered or lessened, it may fail to excite in sufficient amount the uterine autolytic enzyme with the result that the endometrium, lacking its proper preparation and softening, acts as a barrier to an easy escape of blood. The congested membrane hence remains to form a foreign body and set up uterine spasm, or becomes detached in the comparatively large portions that are characteristic of membranous dysmenorrhœa. Therefore, cases most suitable for corpus luteum therapy are those characterized by excessive first-day pain, with scanty discharge, followed later by a free flow and immediate relief from pain.

CAREY CULBERTSON.

Sanes, K. I.: Menstrual Statistics; a Study Based on 4,500 Menstrual Histories. *Am. J. Obst.*, N. Y., 1916, lxxiii, 93.

The author has made a very careful statistical study of over 4,500 menstrual histories from the records in his office, and while they may not be as accurate as one might wish for an ideal study, they are from histories taken with special attention given to accuracy in securing the menstrual data and are therefore as nearly correct as they can ordinarily be made.

Seventy-five per cent of the women menstruated regularly and 25 per cent irregularly. The most common type met with was that of 28 days, which constituted 72 per cent of the cases. The 30-day type followed next in frequency with only 3.8 per cent, and the 21-day type with 3.3 per cent, etc. In some of the 31-day type the menstrual flow appeared monthly on the same date independent of the number of days in the month. The common irregular types were 3 to 4 weeks, then 4 to 5 weeks, 2 to 3 weeks, 5 to 6 weeks.

The most common ages of onset in the order of their frequency were 13, 14, 15, 12, 16. The age of onset did not show any relation to regularity or irregularity of menstruation. The earliest age of onset in the author's series was 9 years and the latest 24 years.

The common duration of the menstrual flow was 3 days, then 4 to 5 days, 3 to 4 days, 5 days, 7 days, and 4 days. The irregular type of menstruation showed a larger percentage of long duration and

smaller percentage of shorter duration than the regular type.

The quantity of flow in 45 per cent of women was normal, in 17 per cent scant, and in 37 per cent profuse. Irregular patients showed a higher percentage of profuse flow than the regular ones. Hyperthyroidism cases showed a very high percentage of profuse menstrual flow, 65 per cent.

Clots were very frequently found in menstrual flow and the author did not find them to be influenced by menstrual irregularity.

Of the series 47.4 per cent suffered from dysmenorrhœa, if the term dysmenorrhœa conveys the idea of discomfort. In retrodisplacements the percentage was found to be 50.4 per cent. In 50 per cent of the dysmenorrhœa cases the symptoms appeared during the flow in 29 per cent, before; in 17 per cent, before and after; and in the rest after the flow or during and after. Most frequently the dysmenorrhœa appeared the day before the flow, then the first day of the flow, then 2 days during, 2 days before, 1 day before and 2 days during, then 3 days before, and 7 days before.

Improvement in menstruation was frequently noticed with the advance of menstrual life, after marriage, and after childbirth, the menstrual period becoming more regular and the dysmenorrhœa improving or disappearing entirely.

The most common ages of menopause in the order of their frequency were given as 50, 46, 48, 47, 51, 49, 44, 45, 52. The length of menstrual life was most commonly given as 37 years, then 35 and 33. Sixty-eight per cent reported a menstrual life of thirty years or more. The very early and late ages of puberty showed an early menopause.

The paper is accompanied with many interesting and useful tables. C. H. Davis.

Wilcox, D. G.: The Treatment of Pelvic Adhesions. *N. Eng. M. Gaz.*, 1916, li, 35.

The author seeks first to show how Nature deals with infected and threatened suppurative viscera of the pelvis and abdomen. Upon the first intimation which Nature receives that a perforation of any of the abdominal viscera is about to take place, she loses no time in preparing for the catastrophe by commandeering all adjacent structures and cementing these structures to the weakened spot in the viscera.

He calls attention to the fact that not infrequently a young girl will have appendicitis, will recover without operation and remain well until she begins to menstruate; then she becomes more or less of an invalid from pain in the right ovarian region. If this is allowed to go unattended she may be rendered miserable for the rest of her days. She may even become sterile in consequence. The cause of all her trouble is due to a leaky or ruptured appendix which allows pus or infected serum to trickle down upon the right tube and ovary and there sets up a perisalpingitis or ovaritis with resulting adhesions. This occurs not infrequently where cases of appendicitis are allowed to go without surgical treatment. Any condition causing a localized peritonitis may leave in its trail adhesions of tubes, ovaries, or uterus.

It is well recognized by all gynecologists that a woman who has adhesions of the uterus or adnexa to any great extent is an invalid according to the density and extent of those adhesions. The reason she is an invalid is:

1. Because these organs bound down, twisted or bent by exudates, cannot properly functionate. If she is a young woman she will in all probability have a distressing dysmenorrhœa which did not appear prior to the adhesions. Also, she is likely to be sterile because the tubes are occluded, or the fimbrated end closed.

2. She is an invalid because she is subject to recurrent attacks of acute localized peritonitis, due to an escape of pus or serum from a partially occluded tube.

The more dependable evidences of pelvic adhesions are summarized as follows:

1. A dense inelastic pelvic floor. In attempting to push up the cervix with the inserted vaginal finger, or to push down upon the uterus with the abdominal hand, a rigid pelvic floor is found which permits of no freedom of motion on the part of the uterus or cervix. That in itself is almost diagnostic of pelvic adhesions.

2. Unusual and general pelvic sensitiveness. It is rare that one finds a uterus bound down by adhesions where the tubes and ovaries are not implicated; hence, there must be sensitiveness in such cases.

3. The presence of a tumor or mass behind or on either or both sides of the uterus. This tumor is usually composed of tube and ovary with a mass of exudates holding these structures just behind or at the side of the uterus. These masses are always sensitive, in which point they differ from a small fibroid or an ovarian cyst which might be found in the same locality.

4. The position of the uterus. If adhesions have formed after a woman has had one or more children the chances are quite strong that the fundus will be found well fixed in the hollow of the sacrum. If she has not borne children the fundus may be in its proper position, but whether nullipara or multipara the fundus is more likely to be retrodisplaced, and when so, it is almost impossible to lift it above the promontory of the sacrum.

The author emphasizes the danger of inserting a pessary in a woman suffering from an old-time salpingitis, the traumatism of which may be just sufficient to cause a tear in the adhesions, with a fatal infection following.

The author next refers to the value of glycerine, iodine, or ichthyol tampons for a certain class of these sufferers and how in many instances these applications if properly administered will melt down the adhesions and give marked relief.

As to operations, he says, "After all these measures have been diligently and intelligently employed

there will remain a certain proportion of patients who must come to operation or remain confirmed invalids, and it becomes the duty of physicians treating such cases to make a careful study in the selection of them in order that neither they nor his reputation may suffer thereby. There is no hard and fast rule laid down for the determination of the operative cases and the non-operative; each must be studied upon its own merits. But any patient who is suffering from pelvic adhesions due to an old-time attack or inflammation of some of the pelvic organs, no matter how severe or how long, stands an excellent chance of being permanently cured by the employment of some of the herein mentioned methods of treatment."

The use of the Crump oil for the purpose of preventing post-operative adhesions is strongly endorsed.

Sullivan, A., and Spaulding, E. R.: The Extent and Significance of Gonorrhœa in a Reformatory for Women and a Consideration of the Treatment of Venereal Disease Among Delinquents. *J. Am. M. Ass.*, 1916, lxvi, 95.

After discussing the question from its many angles the authors conclude as follows:

Three methods present themselves as means of dealing with venereal disease among delinquents:

1. The medical problem of venereal disease is very closely associated with mental and social problems. Among the 24 per cent of 500 women who, after careful study, have been considered candidates for permanent segregation, syphilis was found in about 61 per cent while gonorrhœa was found in over 90 per cent. These women have proved themselves to be irresponsible members of the community. They are all defective intellectually according to psychologic tests. They have, besides a bad social record, no home where they can be given suitable supervision. If their segregation is provided for not only is their immoral influence removed from society and the continuance of similar types in the next generation prevented, but just so much actual disease is removed from the community.

The argument may be brought forward, particularly by the layman, that most of the women, especially in the mill towns, associate only with their own type, and so society as a whole is not endangered. Even if this were true, the tendency would be for individuals to be infected who, if crippled mentally or physically by disease, would become public charges and an additional expense to the taxpayer. This would be an additional argument, economically, for the permanent segregation of mental defectives, especially among delinquents.

Before such segregation is possible, however, greater facilities must be furnished by the state for the care of these defectives; and the judges, through whom the commitments must be made, must be shown the need of such segregation.

2. The second method of combating the disease would be the early diagnosis and the intensive treatment of all persons who pass through the courts and are detained in public institutions on any charge.

The ideal treatment of prisoners, according to the most advanced criminologists, is the mental, physical, and social examination of all persons before they are seen by the judge. When such information is obtained before trial, the fact that the prisoner needs treatment for diseases so dangerous to public welfare should influence the judge in his decision, especially when the offense of the prisoner tends to spread such disease. As a help toward this, a law is already in existence in Massachusetts which provides for the treatment of syphilitics while the disease is in a communicable form.

As over 25,000 persons were sentenced to penal institutions during the year ending September 30, 1914, it would seem possible, by suitable treatment, to accomplish much under the present régime. This should include the universal application of the Wassermann test and the bacteriologic tests for gonorrhœa, with insistent treatment for the two diseases while in the institution. The indeterminate sentence makes it possible usually to hold gonorrhœics until they have cleared up clinically, while the law mentioned above would make it possible to hold syphilitics as long as it seems necessary.

3. The third and most important method would be the provision of hospitals throughout the country for the treatment of such persons, if necessary, free of charge. Even in the time of Henry VIII there were six hospitals in London devoted to the treatment of venereal patients. Even though, in this present generation, hospitals for the exclusive treatment of venereal disease are not considered feasible on account of the stigma which would be attached to them, there seems to be no argument against special wards in all hospitals where such treatment could be given.

While a segregated district and attempted medical supervision of prostitutes is not recommended, yet there is limitless opportunity for treatment in the place of the present existing conditions. Fortunately, in Massachusetts the hospitals are beginning to admit patients with these two diseases.

The three methods of treatment which have just been described lie within the province of the physician. Although it is outwardly a social problem and calls for legislation and much social effort, it is fundamentally a medical one and will only progress as the physician appreciates his responsibility and enlists his interest and influence.

EDWARD L. CORNELL.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Heineberg, A.: The Diagnosis of Tubal Pregnancy: a Critical Study of Seventy-five Consecutive Cases. *Penn. M. J.*, 1916, xix, 267.

In a study of seventy-five cases of tubal pregnancy Heineberg brings out the most important symptoms of ectopic gestation. He divides the cases into two classes: (1) before any interruption in the course of the tubal pregnancy has occurred, and (2) after the pregnancy has been interrupted in one of several ways.

Interruption usually occurs before the fourteenth week. Pain is practically the only symptom of an early uninterrupted tubal pregnancy. It may be of varied severity, but it is always paroxysmal in character. Occasionally it is followed by faintness or actual syncope and symptoms of shock. The pain is usually located in the lower quadrant of the abdomen on the side of the pregnant tube and may radiate down the leg of the corresponding side. It is increased during defecation.

Early examination reveals the embryo in the tube as a spindle-shaped nodule, soft, doughy and quite sensitive to the touch. Later the mass enlarges and, as a rule, drops into Douglas' cul-de-sac. It may vary in shape, becomes more elastic and resilient but is still tender. In order to make an early diagnosis before rupture occurs Heineberg urges pelvic examinations in pregnancies accompanied by unilateral colicky pain.

Interruption in the progress of tubal pregnancy occurs usually in one of three ways: (1) by mole formation, (2) rupture of the tube, (3) tubal abortion. The last two methods of termination may occur independently of mole formation, but are frequently preceded by it.

Tubal abortion or rupture usually occurs before the fourteenth week, the average being about the eighth week. The symptoms accompanying this sudden, or "tragic," termination are classical: sudden, severe, cutting pain, usually in the iliac region on the side of the pregnancy; frequently fainting, followed by symptoms of concealed hæmorrhage, such as pallor, restlessness, thirst, air hunger, increasing weakness, faintness, dark spots before the eyes, increasing pulse-rate, and decreasing arterial tension. The pulse-rate may, however, not increase for two or three hours after rupture has occurred. Abdominal tenderness and rigidity soon appear and may extend farther than the lower part of the abdomen. Hæmorrhage from the uterus occurs in over 90 per cent of these cases. The symptoms noted are modified as to severity in cases of more insidious onset with slow bleeding, presenting the "non-tragic" type of ectopic gestation. Here the most significant symptom is uterine hæmorrhage, which is continuous from the onset; the blood is not profuse as a rule and is darker than menstrual, slimy, and frequently contains shreds of decidual membrane. Pain is of varied character, but constant as to location and tendency to recurrence. It is always severer during defecation and urination. Early, the pain is due to a mild peritonitis caused by the presence of free blood in the peritoneal cavity; later, by pressure of the pelvic hæmatocele upon the rectum. Slowly progressive anæmia is present. Differential diagnosis from uterine abortion, ruptured pyosalpinx, appendicitis, and inflammation of other abdominal organs, twisted pedicle of an ovarian cyst, and acute intestinal obstruction can be made by the careful study of the histories and symptoms of these cases, the uterine hæmorrhage being of utmost importance. If the usual methods fail, a posterior colpotomy will help to clear up the diagnosis. L. R. GOLDSMITH.

DeLee, J. B.: The Newer Methods of Cæsarean Section. *Illinois M. J.*, 1916, xxix, 47.

The author gives the early history of cæsarean section and briefly reviews the development of its technical execution.

On account of the danger of infecting the peritoneum, operators sought a method of delivering the child from beneath the peritoneum. Twenty or more methods have been devised for this. They may be divided into two classes, (1) the transperitoneal and (2) the extraperitoneal.

In the transperitoneal operation the belly is opened above the pubis, and the peritoneum over the cervix and near the bladder is incised and loosened from its bed. By means of closely set continuous sutures, or by clamps, the parietal and visceral peritoneal layers are united. The lower uterine segment and cervix are then incised, the child delivered, the placenta following; then the uterus is closed and the double layers of the peritoneum also reunited. The peritoneal cavity thus is temporarily removed from the field of operation and infectious matters, such as meconium, liquor amnii, blood, etc., are not permitted to soil the general peritoneal cavity. Some operators cut the line of sutures and reunite the individual layers of peritoneum. Others sew the two layers together. Sellheim sews the uterine wall to the skin and leaves the wound open to drain, and calls it a delivery through a uteroabdominal fistula.

Among transperitoneal cæsarean sections, that invented by Kroenig and modified by Gellhorn of St. Louis seems to possess most advantages. The

patient is placed in a high Trendelenburg position, thus allowing the uterus to fall away from the pelvis, stretching the lower uterine segment over the head. A median incision is made from the pubis to within two inches of the navel. The peritoneum is opened as usual, having a care of the bladder, which may be very high. The peritoneal line of junction with the bladder is determined and lifted up with forceps. A short transverse incision in the peritoneum is made, similar to that for amputation of the uterus. The peritoneum and bladder are pushed off the anterior wall of the uterus well down toward the external os, uncovering the muscle of the lower uterine segment for a space large enough to make a four and one-half inch incision. The thin lower segment is carefully incised. The head is delivered by forceps after pulling the face into the opening. The placenta is expressed, the uterus cleaned out, packed if need be, and the incision carefully coapted by two rows of sutures closely set. Then the peritoneum and bladder are drawn up over the line of sutures and united on the face of the uterus. Gellhorn's modification consists in uniting, temporarily, during the time of delivery, the parietal to the visceral peritoneum with a continuous suture. This is necessary only in infected cases.

Of the extraperitoneal methods, that of Latzko is the best. In Latzko's operation the incision is made either transversely or longitudinally, just above the pubis. The peritoneum is pulled out of the pelvis and the bladder is pushed off of the cervix to the right. Beneath the vesico-uterine fold, which has been pushed up toward the navel, a bare space of cervix and lower uterine segment is provided, through which the child is delivered.

These newer methods do not entirely remove the danger of infection, adhesion, and subsequent rupture. In severe infections any form of section is dangerous. On the other hand, some cases recover no matter what method is used. In several cases the child has died shortly after delivery.

Peritoneal adhesions are not entirely eliminated by the newer methods. The danger of rupture in subsequent pregnancies has not been definitely determined. On account of scar formations a second extraperitoneal section may be impossible.

The newer methods permit of greater latitude in cases of mechanical dystocia, allowing a thorough test of labor. Technically the operation is more difficult than the classical cæsarean section.

D. H. Boyd.

Planchu: Cæsarean Operation Done for the Fourth Time upon the Same Woman; Subtotal Hysterectomy (Opération césarienne pratiquée pour la quatriéme fois chez la même femme; hysterectomie subtotale). *Ann. de gynéc.*, 1916, xlii, 45.

The woman reported upon by Planchu had undergone three prior cæsarean sections on account of contracted pelvis. At the third section Planchu observed considerable thinning of the wall in the site of the previous scars and thought he could effect sterilization sufficiently by ligating the two tubes. In addition later on during an operation for eventration following the cæsarean section the left adnexa were ablated. Nevertheless the woman again became pregnant, and cæsarean section was again done, supplemented by a total utero-ovarian castration. Examination of the uterus showed a thin zone of wall about 2 cms. wide in the site of the old scars in which the muscular tissue was in great part replaced by fibrous tissue. This was resistant enough save in one point where the wall was only 2 to 3 mm. thick. Rupture would have undoubtedly occurred if the placenta had become adherent at this point.

A. Goss.

Gilles, R.: A Third Conservative Cæsarean Section upon the Same Woman; Operated at Term in the Course of Labor; Twins Born (Troisiéme césarienne conservatrice chez la même femme; opération à terme et au cours du travail; accouchement gémellairé). *Ann. de gynéc. et d'obst.*, 1916, xlii, 42.

The woman whose case is here reported was a rachitic multipara. Her two previous pregnancies had been terminated by cæsarean section. Her present pregnancy began March, 1913. She entered the hospital at the eight month. Labor began early in December spontaneously. Operation was performed immediately. Incision and resection of the cicatrized band resulted from the prior cæsareans. The uterus, immobilized by adhesions, was opened by median section. There was but slight thinning of the wall in the sites of the old scars. Twins were successively extracted, weighing 2,580 and 2,370 grams. After some hæmorrhage and the insertion of a drain, the uterus was sutured in two layers and the abdominal wound closed without drainage.

A. Goss.

Grosse: Uteroparietal Fistula Consecutive to a Cæsarean Operation; Second Cæsarean; Hysterectomy (Fistule utero-pariétale consécutive à une operation césarienne; deuxieme operation césarienne; hystérectomie). *Ann. de gynéc. et d'obst.*, 1916, xlii, 53.

Grosse points out that uterine fistulæ have become more frequent owing to the extended use of the cæsarean operation. Parville in his recent thesis collected 15 cases. The author reports another. The first cæsarean section was done in 1910, followed after three months by abscess and fistula. In May, 1912, the patient had a miscarriage followed by the elimination of blood-clots, etc., through the fistula. Three years later she became pregnant. Cæsarean section was done before the onset of labor, and on account of the fragility of the former scar site the operation was completed by a hysterectomy.

A. Goss.

Burnett, S. G.: Toxic Palsies Complicating Pregnancy. *Med. Herald*, 1916, xxxv, 1.

This paper deals with a classification of the toxic palsies of pregnancy, with a review of the literature,

with some of the author's case reports, and with a summary of his discussion of this troublesome complication.

The diagnostician must differentiate three different clinical pictures; viz.:

1. Paralysis limited to the mental field, characterized by a symptom index picturing mind perversion, a result of damaged memory function, namely, limited or lost memory for recent or present events; disorientation, that is, loss of memory for a time, meaning the hour, the day, the week, the month, the year, and place; misidentification, that is, loss of memory for identifying things, persons, or objects; confabulations, that is, loss of memory for connected description of past and present events, creating a fictitious or delusional mental field with a mingling of depressive and roseate and buoyant descriptions of flower strewn journeys unmade and picturesque episodes not real.

2. Paralysis limited to the somatic field, characterized, by a single nerve trunk palsy limited to a single muscular group, or more; by a paralysis of one or more of the extremities, or all of the extremities, till the only movement left is the head rotation; by a paralysis that is limp and flaccid, with atrophy and the electrical reaction of degeneration present in proportion to the completeness and duration of the paralysis; by a mixed nerve paralysis, giving motor and sensory symptoms.

3. A clinical picture made up of a combination of the mental and physical symptom groupings. This is very confusing to the attending physician. He invariably interprets the mental symptoms as meaning puerperal insanity when in fact there is an organic disease present.

The following cases are reported by the author. Case 1. Multipara, third pregnancy, mental symptoms so severe at the third month as to require abortion. Complete recovery in ten months. Case 2. Multipara, second pregnancy, intense vomiting appearing in the third month and continuing to term. A week after confinement her only voluntary movement was rotation of the head. No mental symptoms developed, and complete recovery was made in one and a half years. Case 3. Multipara, 5 months along in the fourth pregnancy with a history of severe vomiting in each of her former pregnancies. She showed both mental symptoms and general mild paralyses with numbness and disturbances of sensation. Abortion was performed and a dead fœtus delivered. The patient recovered completely in one year. Case 4. Multipara, aged 38, in the fifth pregnancy, severe vomiting for the past four months; the patient delirious at times. The uterus was delivered of a putrid seven months' fœtus. The legs were weak; she had bilateral toe-drop, also paresthesia in the hands. Five days later she had no use whatever of arms or legs, mental confusion was complete. She was convalescent after four months.

Autopsy reports of patients dying of this trouble showed parenchymatous degeneration in the dorsalis pedis, ulnar, median, phrenic, abducens, acoustic, vagus, peroneal, anterior tibial, sciatic, anterior crural, pneumogastric nerves, all of the posterior cord roots; posterior cord columns, and direct cerebellar tracts showed scattered areas of degeneration. The anterior horn cells and Clarke's cells showed a chromatolysis around the nucleus in the body and the periphery. One case showed degenerative changes in the liver and kidneys.

The intent of this paper is to show:

1. The seriousness of a toxic palsy state in the pregnant woman; endangering her life, her mind, her physical well-being.

2. That the brief repetition of the symptom picture in the cases reported will make it easy for the observer to remember.

3. That primiparæ are seldom affected but multiparæ are.

4. That an early abortion will prevent a complete paralytic, or mental attack.

5. That the pregnant state may slip something into the chemistry of metabolism, causing a toxic neural inflammation symptom syndrome resembling that of Korsakow's disease, but differing from Korsakow's disease in the acuteness of the toxæmia, more often causing death by attacking the phrenics and pneumogastrics.

6. That the neural inflammation complicating pregnancy may be confined to a single nerve trunk, to one limb, to all the limbs including the trunk, the diaphragm, one or more of the cranial nerves, or, the pneumogastric alone, causing death, or, to the intracerebral structures; namely, the brain cells and their association neurons causing only mental symptoms with or without delirium, minus fever.

7. That severe and uncontrolled vomiting usually precedes a general paralysis; that the vomiting is milder or absent in the mild or restricted palsies, indicating a severe or mild underlying toxæmia, respectively.

8. That we are derelict in duty if we fail to advise against a subsequent pregnancy when a previous hyperemesis gravidarum has occurred; that the serious toxæmia is dangerously apt to recur in intensified form. C. D. Holmes.

Brooks, C. M.: Glycosuria in Pregnancy. *Hahneman. Month.*, 1916, li, 59.

During pregnancy either lactosuria or glycosuria is apt to be found. On account of the difference in prognosis it is important to differentiate these two conditions. Lactosuria may be present at any time when the breasts are functionally active and the escape of milk is impeded in any way. It is often of short duration, being present at one examination and absent at another. Lactose does not ferment yeast; responds slowly to the alkaline copper tests, and deflects polarized lights strongly to the right. The condition is not pathological and does not require treatment.

True diabetes during pregnancy is not frequent, because diabetes rarely occurs during the child-

bearing age, and because diabetics seldom become pregnant. Pregnancy may, however, occur in a true diabetic, or diabetes may develop during pregnancy and continue after delivery, or subside and recur with a subsequent pregnancy.

Puoff has compiled the following data from 28 cases reported in the literature:

Number of patients	28
Number of pregnancies	66
Number of labors at term	42
Number of miscarriages	24
Number of mothers living	15
Number of children living	31
Maternal mortality	46%
Total mortality	53%

In view of the high mortality the author seems to favor the induction of labor in patients whose symptoms are not relieved by approved methods of treatment. C. D. HAUCH.

Reder, F.: Surgical Operations During the Pregnant State. *Am. J. Obst.*, N. Y., 1916, lxxiii, 66.

Reder discusses the subject in its relation to the surgical conditions which more commonly arise with the pregnant state and draws the following conclusions:

1. A woman expecting to become pregnant should be thoroughly examined for any physical defect.

2. Such a defect should be corrected, if possible, before pregnancy takes place.

3. No operation that can be deferred should be performed upon a pregnant woman.

4. Any operation that will contribute to the safety of a patient should be performed without hesitancy. C. H. DAVIS.

LABOR AND ITS COMPLICATIONS

Copeland, G. G.: Double Nuchal Displacement of Arms in a Footling Presentation with Breech Anterior, Chin Caught Above Symphysis Pubis. *Surg., Gynec. & Obst.*, 1916, xxii, 109.

Copeland reports the case of a primipara, aged 29, seen first in active labor, membranes already ruptured. The pelvic measurements were: anterior superior spines 24 cm.; intercristal 27.5 cm.; anteroposterior 18.5 cm. Breech presentation was diagnosed. No fœtal movements were felt nor heart sounds heard. The feet were crossed and incarcerated in the vagina. The feet were released, and labor proceeded naturally to the umbilicus; the sacrum came down to the left front. That the fœtus was alive was proved by tickling the soles of the feet; plantar flexion resulted. The cord was hard to pull down; it pulsated feebly. The maternal soft parts were closed tightly around the fœtus and the uterus was tightly contracted. The assistant made suprafundal pressure; the pains increased. The patient was put under light anæsthesia. The fœtus made no advance. The first attempt to reach the arms failed. The chest of the fœtus was crushed in an attempt to get hold of the hands which were found to be at the sides of the neck. The anæsthetic was deepened, but the uterus would not loosen. The arms and head would not turn with the body, nor be thrust up. The child died. Forcible attempts finally disengaged the right arm only after dislocation of the shoulder and fracture of the humerus. The left arm was brought down; the head was turned with difficulty, but was extracted easily afterward. The patient recovered speedily. The fœtus weighed 7.5 lb. and was apparently normal.

Copeland believes that if he had seen the case before the membranes ruptured, he could have done a version, and the case been left to go on naturally as a vertex case, or forceps applied, since the bony outlet was apparently not contracted.

The case is of interest because of its extreme rarity and complexity. DeLee and Munro Kerr report cases of double nuchal displacement in breech presentation but not with head turned also. The patient was examined and there seemed to be no reason why she should not subsequently go through a normal labor.

Harper, P. T.: Contraction Ring Dystocia. *Am. J. Obst.*, N. Y., 1916, lxxiii, 15.

After discussing the subject the author briefly sets forth his views as follows:

Tonic and isolated contraction of Bandl's ring is not only a possible but also a not infrequent cause of dystocia.

It is usually associated with and secondary to other causes of prolonged and obstructed labor. The etiology may be obscure.

It is a major obstetric complication. The dangers to the child are those of intra-uterine asphyxia from continued pressure when the condition is unrecognized or allowed to persist indefinitely, and shock and asphyxia from attempts at operative delivery. The fœtal mortality is high. The danger to the mother is the same as with all other operative obstetric procedures. The maternal mortality should be low. The dangers of tetanus uteri are remote.

There is no unfailing symptom except obstruction.

The only positive signs are those obtained as a result of careful vaginal and lower uterine segment exploration.

Contraction ring dystocia is to be suspected in cases of second-stage delay where all other signs of dystocia have been eliminated or where those that persist cannot of themselves explain the obstruction, and search for the ring should be made at once.

Success in treatment depends upon early recognition of the tonically contracted ring, upon the early disappearance of the structure, and upon the early application of conservative methods of operative delivery. C. H. DAVIS.

MISCELLANEOUS

Hart, D. B.: Inversion of the Ilium and Sacrum and Ischium and Pubes (Iliosacral and Ischiopubic Bony Segments) as Causes of Deformities of the Female Pelvis. *Edinb. M. J.*, 1916, xvi, 9.

Hart recapitulates the chief differences between the normal male and female pelvis. The male pelvis has heavier bones with well-marked muscular attachments, while the female pelvis is roomier and larger and has flatter iliac bones. The true pelvis in the female has a greater capacity owing to its greater transverse diameters. The brim of the female pelvis is reniform, while that of the male is cordate. In the male, the narrow (70 to 75 degrees) pubic arch is contrasted with the wide (90 to 100 degrees) pubic arch of the female. The obturator foramen is ovoid in the male, triangular in the female, and in the male the foramina look more outward. The male sacrum is also longer and narrower. Additional points of dissimilarity found by anatomists are: the great sacrosciatic notch, which in the female is larger, almost rectangular in shape, with a longer periphery, has all its posterior boundary formed by the sacrum; while in the male it is smaller with its edges meeting above at an acute angle and has only the lower portion of its posterior boundary formed by the sacrum. In general, the female ilium is larger and its posterior boundary is less steep and more rounded than in the male. The greater size of the female pelvis is due to a wider pubic arch, a broader sacrum, and a larger ilium and sacrosciatic notch.

The origin of the differences between the adult male and female pelves has been considered by several writers, Schroeder being the chief exponent of the mechanical theory of postnatal development. Fehling and Thompson, however, have noted that the fœtal pelvis after the third month could be diagnosed as to sex both by the brim transverse and the sacrosciatic notch. Hart agrees that the ultimate shape of the pelvis is determined before birth, but that the lumbar curve of the spine, the greater curve of the sacrum, and the brim inclination to the horizon are due to postnatal influences.

To explain certain deformities Hart believes that the female pelvis may be considered as consisting of two segments: (1) ilium and sacrum and (2) ischium and pubis. In certain female pelves either the iliosacral or the ischiopubic segment may be male and both types of "inversion" may produce serious deformity. The author reports seven pelves showing one or the other of these peculiarities. Six may be classed generally as male iliosacral and one as male ischiopubic inversion.

Hart believes that these types have an embryological basis. He suggests that when the fœtal germ and sperm cells are undergoing mitosis in the fœtal sex glands certain determinants, which should normally be present, are absent by variation. The conjunction of a germ cell having no iliosacral determinants with a sperm cell having these determinants would produce a female pelvis with male iliosacral inversion.

In the iliosacral form of pelvis the contraction is at the brim and requires cæsarean section or pubiotomy. With the ischiopubic variety the contraction is at the outlet and may be formidable.

F. C. Irving.

Sloan, H. G.: The Diagnosis of Intracranial Bleeding in the Newborn. *Cleveland M. J.*, 1915, xiv, 808.

In case of difficult or prolonged labor, where there has been a difficult instrumental delivery, or where there is tardy starting of spontaneous respiration, the babe ought to be carefully watched for the next few days for evidences of cerebral bleeding.

Early symptoms of cortical irritation are most valuable in localization of the bleeding. Bleeding above the tentorium can be differentiated from that occurring below it. When symptoms of general increase in intracranial pressure become marked, a decompression operation should be done. The best results are seen when decompression is done while the pulse is still slow and before respiration becomes irregular.

In parietal decompression the babe should be well wrapped in a warm blanket and laid on several half-full hot water bottles. The whole head is shaved. The skin is prepared with alcohol after cleansing with benzine, and a rubber tourniquet applied around the frontal occipital circumference just above the ears. This tourniquet is put on after the head has been covered with a single layer of gauze saturated with alcohol. It is best to do these operations under as little anæsthesia as possible, but where it is needed, a few whiffs of ether will suffice.

The incision is made through the skin and fascia down to the periosteum just inside the concave edge of the parietal bone, extending 1 cm. from the midline well down toward the ear and following the contour of the bone. The periosteum is then pushed aside along the concavity of the suture line and the edge of the suture opened sufficiently by a sharp knife through its cartilaginous border to allow the introduction of a pair of strong-bladed curved scissors. The bone is incised along an oval line about 1 cm. from and parallel to the suture line, care being taken to avoid the area of the suture because here the dura is adherent to the overlying cartilage. The base of the incision is made omega-shaped, that is, narrow at the bottom, and extends to just above the ear where the bone-flap will be approximately 5 cm. in breadth. Here the bone is broken between two strong hæmostats, care being taken not to damage the dura by the rough spicules caused by the fracture. The dura is picked up with needles and opened with a sharp-pointed knife. The incision is made about 1 cm. distant from the bone cut in order that the dura may be closed accurately. All vessels cut in the dura are divided between fine silk sutures, and the dural flap is reflected down-

ward. Dark coloration beneath the dura points to a blood-clot immediately beneath it. If the brain bulges, the base is very gently explored with a flat, smooth instrument, raising the brain in order to see if there is any unclotted blood mixed with the cerebral spinal fluid over the base. In case the blood is clotted, the clot is merely evacuated, the bone replaced, and the wound closed without drainage. In case the cerebrospinal fluid is mixed with blood and is unclotted, it is wiser to introduce a rubber tissue covering taken from a cigarette drain for the first 24 hours. If the bulging brain makes the closure difficult or impossible, it is wise to do a lumbar puncture in order to further relieve pressure before closing. Accurate closure of the dura is absolutely necessary in order to avoid subsequent scar formation between the suture line and the cortex. Where no bleeding is found and yet the brain bulges markedly, it is advisable to do a bilateral decompression in order to allow for expansion arising from brain œdema. Where ventricular bleeding is suspected, it is evacuated by a hollow needle.

EDWARD L. CORNELL.

Calderon, F.: Tropical Obstetrical Problems. *Philippine J. Sc.*, 1915. x, 371.

The author records a number of superstitions relating to the pregnant woman in the Philippine Islands. The *asuang*, an active evil spirit, is supposed to have a great influence on the pregnant woman. The *asuang* being more troublesome at night, pregnant women stay in the house at night and keep a light or fire burning beneath the house to frighten away the spirit. If compelled to leave the house they let down their hair which prevents the *asuang* from transforming the child into another *asuang*.

If a pregnant woman eats rice-crust, the expulsion of the placenta will be delayed. If she voids urine on the ground, water must be poured over the spot of voiding otherwise the *asuang* will smell the urine and the woman will have a hæmorrhage at time of labor. During the last three months of pregnancy, *pagbubungkal* is performed, which consists in turning the child in order to place it along the median line of the mother.

To facilitate labor the midwife or an assistant pushes on the fundus with the hand or a piece of wood, sometimes resulting in rupture of the uterus.

After the birth of the child the cord is not cut until the placenta is delivered. If the placenta is delayed the midwife pulls on the cord and pushes on the fundus. The placenta is buried in the ground, and if the hole is too small the baby will have a poor appetite and if too large the baby will be a glutton. The cord cut in pieces and hung on the eaves of the house is believed to prevent the diseases of childhood.

After delivery the operation of *pagkaban* is performed on the mother. The midwife and assistant squat on each side of the woman, grasp hands across her body and compress the pelvis with their feet.

If there is post-partum hæmorrhage the mother's hair is bound tightly on the top of the head. A tight abdominal binder is always worn and the abdomen is massaged every day for eight days. No bath is given for ten days and then in an extract of the leaves of certain plants.

In order to educate the public and improve the service the obstetrical department of the University of the Philippines has instituted a series of lectures and conferences dealing with subjects pertaining to pregnant women, care of the baby, etc.

The number of confinement cases with medical assistance has been increased from 5 per cent to 70 per cent in the city of Manila.

The following table shows the number of cases and complications from July, 1907, to December, 1914.

	Hospital	Outside	Total	Per Cent
Complications				
Placenta prævia	125	15	140	4
Eclampsia	125	8	39	1
Puerperal infection	115	4	119	3
Operations				
Forceps	158	69	227	6
Podalic version	121	17	138	3
Embryotomy	15	...	15	..
Cæsarean section	16	...	16	..
Laparotomies for abdominal pregnancy	...	...	2	..
Maternal deaths				
Placenta prævia	...	...	36	25
Eclampsia	...	...	18	45
Puerperal infection	...	...	19	15
Other causes	...	...	84	..

Placenta prævia is frequent, due to the defective management of previous labors.

The indication for forceps was chiefly inertia. In transverse presentation seen early, version was performed; in neglected transverse cases, embryotomy was resorted to.

Placenta prævia was the indication for cæsarean section in all but one case it being an intrapartum eclampsia in a primigravida. Three patients on whom section was performed have since had normal spontaneous deliveries.

Contracted pelvis is rare although the Filipino woman has a small pelvis compared with a white woman. The baby's head is however proportionately smaller.

With the present facilities obstetrical teachings in the Philippines have so improved that the fourth and fifth year medical student sees 42 cases of labor individually, some of which he delivers under supervision.

D. H. BOYD.

Cullen, T. S.: The Relation of Obstetrics, Gynecology, and Abdominal Surgery to the Public Welfare. *J. Am. M. Ass.*, 1916, lxvi, 239.

With the rapid development in these three branches, new problems have arisen and it may be well to consider briefly the relation they should bear to one another.

Obstetrics. A thorough knowledge of this art is infinitely more important to the student than is a clear understanding of gynecology. The vast

majority of medical students after graduation attend obstetric cases. These young general practitioners, if living in a fair-sized town or city, may be able to consult with an obstetric expert when in trouble, but often the practitioner's time for temporizing is so limited that he must rely absolutely on his own initiative. The physician living in the small town or in the country must pilot his patient through the dangerous shoals, relying entirely on the knowledge he has obtained from his former teachers, coupled with a goodly supply of common "horse-sense." Gynecologic cases rarely call for such speedy treatment. If the general practitioner is uncertain as to his diagnosis and does not know just what to do, he can as a rule temporize for a day or two and in the meantime have a consultation with a gynecologist. Furthermore, most of the gynecologic patients are well enough to journey to the city to see the gynecologist at his office or at the hospital. In obstetric cases the vast majority of physicians are obliged to take full charge of the case irrespective of its gravity; hence the absolute necessity of turning out graduates of medicine thoroughly grounded in the theory and practice of obstetrics.

Gynecology and abdominal surgery. The greater part of gynecology deals with the surgery of the lower abdomen. Sometimes the operation is confined entirely to an exploration of the abdomen, but frequently, as in prolapsus cases, in order that a satisfactory result may be obtained it is necessary to carry out some vaginal operation in connection with that in the pelvis. Where large tumors exist, the confines of the pelvis are temporarily carried far up into the abdomen, occasionally as high as the liver, and now and then the intestines are densely adherent and may require resection.

Every man who aims to make abdominal surgery his lifework should have a thorough training in general medicine. He will then know that pain in the right iliac fossa does not always mean appendicitis. He will know that occasionally this soreness is present in an early stage of typhoid fever. He will remember that there is such a thing as lead colic and that in children severe abdominal pain may be the precursor of pneumonia. A thorough knowledge of this broad and fundamental branch of medicine will save him from many pitfalls.

In addition to his course in general pathology, he should have an extensive knowledge of the pathology of all the abdominal structures. The abdominal surgeon of the future must be well-grounded in pathology; two years in the necropsy room would be of inestimable value to him. He should then pay particular attention to the bacterial flora associated with the various abdominal lesions. After he has finished his apprenticeship he should become an assistant of an abdominal surgeon. Here he will not only learn the various operative procedures and perfect himself in them, but he will also become experienced in the preparatory and after-treatment of patients. The after-treatment, by the way, is of great importance, the post-operative journey often being rough and tempestuous, or relatively smooth, according to the manner in which the assistant handles the case. After several years spent in this way, the assistant is thoroughly competent to start out on his career. The surgery of the United States has made wonderful strides during the last decade, and we must prepare ourselves to become the graduate school of the world.

1. Obstetrics must be made more attractive so that those entering this branch will not be tempted to leave it for less laborious fields.

2. Any surgeon opening the abdomen should be capable of performing any abdominal operation that may be necessary. In other words, gynecology and abdominal surgery logically belong together.

3. This re-alignment of abdominal surgery is absolutely necessary if the maximum amount of good for the patient is to be accomplished.

EDWARD L. CORNELL.

Malsbary, G. E.: Marriage. *Am. J. Obst.*, N. Y., 1916, lxxiii, 44.

After discussing this important subject the author draws the following conclusions:

1. Those contemplating matrimony should be encouraged to seek the advice of their physician.

2. The advice of the physician concerning a proposed marriage should be given only after a scientific study of the proposed union, and as careful examination and deliberation should be accorded as in a major operation.

3. It is only by such conduct that the profession can hold the confidence of the people and maintain the right to be consulted in such matters.

4. No application for advice regarding matrimony or allied matters should be taken otherwise than seriously.

5. The eugenic movement, though worthy in spirit, must ultimately fail unless it is supported and guided by scientific and medical men.

6. This paper though necessarily far from complete, shows there is a remarkable absence of the "rule of thumbs," that practically every case has to be decided on its merits, and that usually an intelligent opinion can be given only after examination and mature deliberation. C. H. DAVIS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Cabot, H.: Errors in Diagnosis of Renal and Ureteral Calculus. *Internat. J. Surg.*, 1916, xxix, 20.

In a study of 153 cases of stone in the kidney and ureters, it was noted that 26 abdominal operations had been performed without relief of symptoms, which were clearly due to the overlooked calculus in the kidney or ureter, the appendix being the most frequent sufferer, followed in order of relative frequency by "exploratory laparotomy" and fixation of movable kidneys. The crowning iniquity was suprapubic cystotomy on a normal bladder for a stone situated a few inches away.

In all of this group of cases the pain was never such as to suggest stone in the kidney, from which it is seen that pain as an important evidence of stone is apt to be highly misleading.

In 150 cases in which the urine was carefully examined on more than one occasion, there were 21, or 14 per cent, in which it was entirely normal. It further appears that the probability of normal urine is much greater with stone in the ureter than with stone in the kidney. Thus of the 21 cases of normal urine, 15 were of stone in the ureter, while 6 were of stone in the kidney.

The author lays down the following rules as of aid in avoiding errors in diagnosis:

1. In all cases of abdominal pain of a recurring or abdominal type, in cases of backache, lumbar, or sacro-iliac strain, or lumbago, careful and repeated examination of sedimented urine, as well as the taking of X-ray plates, should precede positive diagnosis.

2. The possibility of error in the judgment of X-ray plates should be excluded by the use of the ureteral catheter, stereoscopic plates, injected radiograph, or the wax-tipped catheter.

3. Where the symptons suggest ureteral calculus and a doubtful shadow appears, if the ureter cannot be satisfactorily catheterized, the decision for or against operation must be made upon the apparent gravity of the symptoms.

4. Where all other methods fail, the wax-tipped catheter is probably the most unerring guide, except where the stone lies out of reach in a dilated calyx.

H. W. PLAGGEMEYER.

Paschen, R.: The Ultimate Result of Operation for Grawitz' Tumor (Das Schicksal der wegen Grawitz-Tumor Operierten). *Arch. f. klin. Chir.*, 1915, cvii, 213.

There is some question among pathological anatomists as to whether these tumors develop from aberrant suprarenal tissue or from kidney tissue, and as the author does not feel competent to decide it he does not use the usual name, hypernephroma, but calls them Grawitz' tumors, as they were first described by Grawitz. He has collected from the literature reports of 268 cases that have been operated upon, the statistics showing deaths from operation 51, or 19.03 per cent; alive and well after three years 46, or 17.17 per cent. No information as to late results could be obtained in 22, or 8.21 per cent. Fifty-four cases have been operated upon in Paschen's own service at the Hamburg Hospital. Of this series, 6 or 11.11 per cent, died from the operation, while 19, or 35.19 per cent, are alive and well after three years. Over a third of the patients therefore are alive and well after three years.

Paschen has found that the results are much better if operation is done early; therefore he advises exploratory incision as soon as hæmaturia has appeared, if other causes for it such as stone, hæmorrhagic nephritis, etc., can be excluded, even if palpation or roentgen examination do not reveal any tumor.

The tumors appear at all ages, from childhood to over seventy years, but the greatest number occur in the decade between fifty and sixty. He gives the histories of his 54 cases and a bibliography of the subject.

A. Goss.

BLADDER, URETHRA, AND PENIS

Braasch, W. F.: Significance of Vesical Symptoms in the Diagnosis of Renal Conditions. *Internat. J. Surg.*, 1916, xxviii, 412.

The author reviews the common renal diseases which most frequently cause vesical symptoms and also discusses the extravesical causes.

The renal conditions which might produce vesical symptoms are: (1) tuberculosis, (2) pyelonephritis, and (3) lithiasis.

The author states that although vesical symptoms usually predominate in renal tuberculosis the fact has not obtained general recognition. In his experience 90 per cent of patients having renal tuberculosis have vesical symptoms extending over a period of 6 months; 50 per cent have symptoms for more than a year.

Diffuse infection in the renal parenchyma and pelvis with organisms other than tubercle bacilli (or pyelonephritis) causes a variable degree of infection of the bladder. This is usually less severe than in tuberculosis; occasionally, however, it may be so severe that the differential diagnosis is impossible. On the other hand, patients may have general infection of the kidney without vesical in-

volvement. Localizing symptoms referred to the kidney occur less often with pyelonephritis than with tuberculosis.

The fact is emphasized that no cases of so-called cystitis should be regarded as such until renal infection has been excluded. The treatment of these cases by various internal medication and by pelvic operations is condemned until a careful investigation has been made to rule out the presence of an etiologic renal infection. The author believes that the simplest way to establish the diagnosis of these cases is by ureteral catheterization and the only way to exclude renal infection is by bacteriologic examination of the catheterized urine. He regards the pyelogram and the functional tests, especially phenolsulphonephthalein, as of corroboratory and differential value.

Irritability of the bladder and frequency of urination may be the only symptoms with urinary obstruction due to stone in the kidney or ureter. The author states that the absence of vesical symptoms coincident with pain should be a factor in exclusion in the interpretation of a doubtful renal or ureteral shadow. Vesical irritation is persistent when the stone is lodged in the vesical portion of the ureter. In some cases of stone the radiation of pain may be largely referred to the area of the bladder.

The author thinks that cystitis may be present without renal infection and has observed a number of cases which failed to show evidence of renal involvement. Bladder neuroses are usually accompanied by other evidences of neuroses and the bladder symptoms seem to be a part of a syndrome.

The author states that in the differential diagnosis of the various causes of irritability of the bladder, although the adjacent extravesical conditions have to be considered, the importance of their relation to bladder symptoms has been exaggerated. He classifies these causes as due to: (1) pressure of a tumor; (2) mechanical interference; (3) malignant involvement; (4) direct extension of an adjacent inflammatory process.

Although the pressure of an extravesical tumor may occasionally be the cause of vesical irritability, it is surprising how small a proportion of uterine tumors give bladder symptoms.

Mechanical obstruction to the urinary outflow as the result of uterine displacement in an otherwise normal uterus is not common in the author's experience. Large tumors of this organ and the adnexa are occasionally situated so as to cause mechanical obstruction. In the author's experience cystocele is the cause of urinary retention only occasionally.

Involvement of the bladder by malignant conditions in the pelvic organs does not occur frequently with operable cases. Cancer of the rectum involves the bladder more frequently than cancer of the uterus.

When vesical symptoms result from bladder involvement secondary to inflammatory conditions in the female pelvis, evidence of the vesical lesion may always be shown by cystoscopic examination.

The author concludes by urging a careful consideration of all of the possible causes of vesical symptoms, including renal infections, ascending infections, local infections, ulceration and neurosis, and that plastic operations on the pelvic organs be resorted to in exceptional instances only.

G. J. THOMAS.

Kretschmer, H. L.: Cystinuria and Cystin Stones; a Report of a New Family of Cystinurics. *Urol. & Cutan. Rev.*, 1916, XX, 1.

Kretschmer reports two cases of pure cystin vesical calculi in nine-year-old twin brothers, two of whose sisters had cystin crystalluria, a brother sulphur in the urine, while the mother's urine was negative and the father's urine not examined.

In the first case symptoms had begun three years prior to examination with difficult urination and later incontinence. Still later an attack of retention developed, when catheterization gave 12 ounces of normal urine. Cystoscopy revealed three stones the size of hazelnuts and no cystitis. Reflexes were normal.

In the second case similar symptoms were noted with a colon bacillus cystitis superimposed; there was one large stone in the bladder and in addition there were septic symptoms; patellar reflexes were not obtainable; the penis remained semierect and one arm was involved by an old infantile paralysis.

The treatment consisting in litholapaxy was followed by recovery in both cases.

In both cases the stones gave good X-ray pictures, in contradiction to the usual idea that cystin stones do not cast X-ray shadows.

A review of the literature shows that cystin stones are usually pure; are a family affliction, due to some metabolic error preventing complete protein oxidation, or to a sulphur-removing defect; that removal of the stone does not always relieve cystinuria; and that all treatment is more or less unsatisfactory.

G. S. PETERKIN.

Hamer, H. G.: Limitations of High-frequency Treatment of Papilloma of the Bladder. *Lancet-Clin.*, 1916, CXV, 45.

Hamer's reports show that recurrences after the use of the high-frequency current are considerably less than after operation for papilloma of the bladder. He emphasizes the fact that no one is clinically able to make a diagnosis of malignancy definitely in these tumors, and that all of them should be regarded as malignant until microscopically proved benign. The clinical signs of malignancy of bladder tumors must be classified anew for this line of treatment. The failure to respond to the high-frequency current indicates clinical malignancy.

Twenty-three cases are reported. There was recurrence or secondary growth in one case of malignancy of the bladder after twenty-six applications of the high-frequency current. This case had been previously operated upon radically after removal of

the primary tumor. There was recurrence in 2 cases of benign tumor after nine and twelve treatments, respectively. Of 15 cases 8 are well after four months to two years. One died of other causes. Six are still under treatment. The maximum number of treatments was forty-two. Both the Oudin and D'Arsonval currents were employed in treating these cases. Applications of the high-frequency current in these cases of carcinoma showed some hæmostatic effect and slight reduction in the size of the tumor, or, on the other hand, marked reduction in size, followed by rapid growth uncontrolled by burning. In one case, the treatment seemed to cause more rapid extension.

The conclusions reached are:

1. High-frequency cauterization is an important addition to our means of attacking vesical papillomata of the non-infiltrating type.

2. All benign papillomata should be treated primarily with the high-frequency current in view of the high percentage of recurrences following open operation (50 per cent) and the high mortality (10 per cent).

3. In cases in which suprapubic operations have been done recurrences should be looked for, and if present, treated by fulguration upon their first appearance.

4. In dealing with papilloma involving the vesical orifice and prostatic urethra, perineal cystotomy with removal of as much of the tumor as possible, and applications of the high-frequency current to the remaining growth seems a rational procedure.

J. EISENSTAEDT.

Morton, H. H.: Stricture of the Urethra. *Med. Times*, 1915, xliii, 382.

The first case was neglected stricture of the urethra, in which two previous operations had been performed but no sounds were passed and there was a recontraction of the stricture. A third operation was performed. The urethra was opened in the perineum. The proximal end of the guide was drawn out through the wound and Rand's tunneled knife threaded over it and pushed into the bladder, dividing the stricture bands on the floor. A gorget was introduced and the bands freely divided with a blunt bistoury. The interior stricture was divided by internal urethrotomy. The perineal urethra was partly closed by suture, and a perineal drainage tube introduced into the bladder. The after-treatment consisted in leaving the tube in from four days to a week and then taking it out. The patient will be required to use sounds in order to keep the canal open as long as he lives.

The second case was a traumatic stricture. Nine previous operations had been performed; passage of sounds had been neglected; recontraction followed. The case was treated by continuous dilatation. The patient was a boy of 16. The author first attempted to treat him by tunneled sounds, but after a month gave it up. The nine previous operations made it inadvisable to do a perineal urethrotomy and it was decided to treat the case by continuous dilatation. The method of procedure was the passing of a small instrument, like a filiform guide, through the urethra into the bladder, and leaving it there for twenty-four hours. The stricture widened around the guide and after twenty-four hours the guide could be withdrawn and a little larger instrument introduced. After twenty-four hours the stricture widened a little more and this instrument was taken out and a still larger one introduced. Gradually flexible bulbous bougies were introduced from a No. 12 bougie up to a No. 26. Continuous dilatation is an old plan of treatment and antedates cutting off the stricture by many years. It has its own particular place and was very useful in this case.

H. A. MOORE.

McGavin, L.: Cancer of the Penis. *Clin. J.*, 1916, xlv, 21.

Only 1 to 3 per cent of all cancers are found on the penis, a fact doubtless due to the isolated position of the organ, with the consequent advantage of constant supervision and earlier treatment. The disease shows a predilection for the prepuce, 70 per cent arising there, with phimosis present in nearly every case. In this connection, the author avers that the prepuce has served its purpose in the early history of the race, and is no longer necessary. As a result of the Mosaic law governing circumcision, cancer of the penis has a lower percentage among the Jews than among uncircumcised races. This fact strengthens the opinion that circumcision should be practiced more frequently than it is.

Like all other varieties, cancer of the penis is largely favored by chronic irritation and the production of cicatrices. Prophylactic measures suggested are: avoidance of venereal contamination, personal cleanliness, removal of warts, early treatment of any cause of irritation, and most important of all, circumcision.

Treatment by means of X-ray, radium, etc., has proved thoroughly disappointing. The only cure is early and drastic operation. There is a choice of two operative measures: amputation and complete extirpation. The former may yield permanent good results if done very early and there be no glandular involvement. Experience, however, has shown that frequency of recurrence is in inverse ratio to the severity of the operation. Complete extirpation, therefore, is the operation of choice, for in spite of its severity it yields excellent results. The author does not advise a removal of the testes. In elderly men there is little object in so doing, and very grave danger of consequent senile dementia. In younger men, the risk is less, but castration should be done only in those rare cases where the patient himself demands it. Even in that event, the two organs should not be removed simultaneously, but at least a month should intervene between the two operations.

The author's technique is given in considerable detail. In brief it is as follows: Turn out the whole

mass of glands from above and externally toward the pubes, and leave it attached by the pedicle containing the lymphatic tract. Make a circular incision around the root of the penis. Split the scrotum to within two inches of the anus, and hold the two halves apart, disclosing the whole operative area. Free the penis with its lymphatic tracts and glands from the pubes by dividing its suspensory ligament, and strip the corpora cavernosa back from the ischium, where they are divided with scissors or scalpel; then detach the whole organ.

In so extensive and deep a wound, the author says that suppuration is the rule, and such an operation calls for particular post-operative care. Little value is placed on the use of vaccines for infection. Suggestions are made for the treatment of all probable complicating after-results. W. E. LOWER.

GENITAL ORGANS

Lichtenstern, R.: Transplantation of Testicle into Abdominal Muscles (Transplantation eines Testikels in die Bacuhmuskulatur). *Med. Klin.*, Berl., 1916, xii, 27.

At the Medical Society of Vienna the author demonstrated a 28-year-old soldier who had had a gunshot wound of the urethra and testicles so that the latter had to be removed. Two weeks later sexual desire had disappeared.

The fat tissue about his neck increased and his beard became thinner. The author took the testicle of a patient who was being operated upon for inguinal hernia, cut it in two parts and sutured the parts into the abdominal muscles on each side of the midline. On the sixth day libido and erection reappeared, and three weeks after the operation were still active. His neck had become normal and the beard had grown thicker.

TANDLER said he considered this an important experiment as showing the effect of the sexual glands on libido and secondary sexual characters. He believes, however, that the testicle will share the fate of most implanted organs, that it will atrophy after a time. Potentia coeundi is dependent on the interstitial substance of the testicle. The testicles of cryptorchids are not capable of reproduction, but the interstitial substance is normal. Such implantations should be made as frequently as possible.

LATZKO said overies had been implanted in women with excellent, but temporary, results; after two or three years the effect disappears because the ovary atrophies. In this case of transplantation of the testicle he thinks the result will be temporary also. A. Goss.

McKeon, F. H.: Report of a Case of Periprostatic Abscess of Tuberculous Origin. *N. Mex. M. J.*, 1916, xv, 156.

In April, 1915, the patient began to complain of pain in the lower lumbar and suprapubic regions, and adductor region of both thighs, the pains growing gradually worse until the patient was unable to walk. He had two attacks of gonorrhœa, one in 1905, complicated by arthritis of the left knee, the second in 1909, which was accompanied by orchitis. The right lobe of the prostate was enlarged and nodular. Cultures showed staphylococci and a few streptococci.

A psoas abscess developed, aspiration showed tubercle bacilli. Polyuria, dysuria, and tenesmus supervened. The cavity was found to lead toward the true pelvis and prostate. Under general anæsthesia a suprapubic incision proved the condition to be an abscess of the right lobe of the prostate. After resection of the right vas deferens the patient recovered. H. A. KRAUS.

Randall, A.: Prostatisme Sans Prostate. *N. Y. M. J.*, 1915, cii, 1123, 1177.

The author calls attention to a condition of the vesical neck simulating hypertrophy of the prostate in which the prostate is not enlarged, the symptoms of which are due to median bar formation. The early history of the first observation on this subject is given in detail. The anatomy and physiology, the etiology and the symptomatology are thoroughly discussed. Drawings illustrate the normal and contracted vesical neck, the normal anatomy of the vesical orifice, and the bladder musculature.

The author believes that the medical profession has learned to recognize the symptoms of the third stage of prostatism, but has not learned that this classical picture may be due to other conditions than hypertrophy of the prostate.

Mercier is generally given the credit for first describing this condition, but the honor belongs to G. J. Guthrie, an Englishman who lectured upon and described this condition in 1830. His conclusions are: (1) that the elastic structures at the neck of the bladder may be diseased without necessary connection with the prostatic gland; (2) that the prostate may be diseased without any necessary connection with the elastic structures.

The author reviews the anatomy of the bladder, prostate, and posterior urethra, and gives the position of the sphincters and their relation to the musculature of the bladder and the urethra and prostate. The act of micturition is described as a simultaneous association of voluntary and involuntary muscular action, as likewise one of inhibition and stimulation.

Guthrie defines two distinct types of obstructive bars: (1) An unnatural elevation of certain fibrous structures which underlie the mucous membrane at the posterior or vesical limit of the urethra, but which is unaccompanied by and unconnected with any enlargement of the prostate. The normal elasticity is lost and an unyielding structure forms the barrier which is due to a localized disease. (2) Intravesical enlargement of one lobe of the prostate so affects the orifice that the bar formed at the neck of the bladder consists of mucous membrane elevated and drawn tightly across the under part

of the opening in consequence of its connection with the prostate through the subjacent parts. In this type if the prostate could be removed the mucous membrane would fall back in its proper place.

Civiale attributed the cause of non-prostatic obstruction to (1) an abnormal development; (2) inflammation associated with an involuntary contracture, either temporary or permanent; or (3) rheumatism. He also thinks that in these cases instead of an hypertrophy of the prostate an atrophy is more likely to be found.

Mercier gives two types of bar formation: One is due to repeated spasms of the muscle fibers of the internal vesical sphincter, until after long-continued and oft-repeated attacks these fibers become permanently contracted so that as a consequence a bar or barrier is formed by the posterior lip of the vesical orifice. This is termed the muscular type and is due to an excitant of muscular activity. The second is due to hypertrophy of glandular tissue of the median portion of the prostate. This is termed the "prostatic" variety.

The French observers including Guyon did not accept Guthrie's idea, but were of the opinion that the cause of the retention could be found in the bladder wall itself, that hypertrophy of the prostate was but a concomitant factor and not the pathological change responsible for the obstruction.

In 1897 Eugene Fuller stated that in his opinion the cause was situated at the vesical neck and the result of functional contracture or spasm secondary to some settled disorder of the genito-urinary tract and compared it to the action of the sternocleidomastoid muscle in torticollis.

In 1905 C. H. Chetwood came to the conclusion after a study of 36 cases that there was not an hypertrophy of the muscular elements of the internal sphincter but a fibroid stenosis of the orifice.

Civiale first pointed out that at operation the prostate was smaller than normal. This led many German observers to attribute the condition to a primary atrophy of the gland. Some think the change a congenital hypoplasia, while others think it is due to atrophy secondary to inflammation. The advocates of the atrophic theory of obstruction have tabulated the conditions under which an atrophy of the prostate may be expected as: (1) atrophy of inflammation, (2) atrophy of cachexia, (3) atrophy of compression, (4) atrophy of castration, (5) senile atrophy, (6) congenital atrophy, (7) traumatic atrophy, (8) atrophy following X-ray exposure.

Another theory offered as a cause of vesical insufficiency is the loss of the Hemmenden reflex. Albarran and Nouges brought this out before the First International Congress of Urology.

The symptoms develop gradually as in hypertrophy of the prostate and as the result of the bar and not because of it, as in hypertrophy. The condition occurs at a younger age than prostatitis, many cases occurring below 50 years. Some cases are of congenital origin and do not form symptoms until adult life. The author thinks that the degree of amount of obstruction when of congenital origin may vary, as may also the age at which symptoms become obvious.

Delay and difficulty at the outset of micturition is one of the early symptoms. There is diminution in the force of the stream; the trajectory is decreased, the size lessened, and considerable straining is necessary to micturate, and finally dribbling results.

There may be burning at the neck of the bladder though not a distressing pain. Pain referred to the lumbar region, the hips, perineum, or thighs is present in about 50 per cent of cases.

Residual urine is at first small in amount and is retained just back of the trigone where as it increases it causes pouching of the bladder and possibly diverticulation. The amount is usually less than 100 ccm. Incontinence of overflow is occasionally seen, but patients usually come for treatment before this amount has been retained. Residual urine is a most important sign from which all other symptoms develop.

The association of a Neisserian infection is hard to confirm. Previous infection in the prostate probably leads to changes which are obstructive in character. When residual urine is carried there is constant danger of infection, and it becomes a certainty if a catheter is constantly used. Everything is conducive to perpetuation of infection in these cases. Cystitis is not common, but infection causes urgency; frequency is more marked and urination painful. It may cause contiguous or metastatic infections elsewhere in the body.

Frequency is an early symptom because of irritation at the vesical neck, from obstruction, from congestion, and from the constant infection.

Some patients come for advice for renal insufficiency only, not appreciating the nocturnal frequency and urgency which had been present for some time. The physician who has a patient with the symptoms of vesical neck obstruction should look out for renal insufficiency. Failure of the kidneys in these cases is due to obstruction. Heitz-Boyer has shown experimentally that in chronic interstitial nephritis, it is the "concentrating power" of the kidney that suffers.

The continuous presence of residual urine and infected urine is a constant invitation to precipitation of urinary salts. The author thinks that in many cases of vesical calculus the cause of stone formation is overlooked.

The view has been sustained since the writings of Englisch that in the majority of cases the primary change in prostatisme sans prostate consisted of an atrophic shrinkage of the prostate gland, and that the obstruction to the vesical orifice was due to a secondary distortion from such changes, plus a concomitant sclerosis of the internal vesical sphincter.

These obstructive bars thus formed may be divided into three groups as follows:

1. Valvula mucosa, appearing as a thin, uniform reduplication of the mucous membrane, arising from the posterior lip of the orifice.

2. Valvula muscularis, formed of dense, thick tissue, with smooth surfaces, covered with thin mucous membrane, and consisting chiefly of sphincter muscle tissue. This is considered to be the most prevalent type of bar formation.

3. Valvula musculoglandularis, due in reality to an underlying hypertrophy of the glandular tissue of the middle lobe of the prostate.

A fourth type has also been described, which is a pure muscular hypertrophy, forming a circular muscular stricture surrounding the entire urethral opening.

After reviewing the various causes of atrophy of the prostate, Randall says that the only types which, on account of the frequency of their occurrence, demand attention are congenital atrophy, inflammatory atrophy, and senile atrophy. It is still an open question whether even this simple classification allows of differentiation microscopically, and probably it will stand as one of clinical importance only. The ultimate pathological picture is a destruction of the normal gland elements, a connective-tissue infiltration, and a general contracture or shrinkage of the entire organ.

Randall attributes to Young the first comprehensive study of the actual obstructive tissue at the orifice, comprising the conclusions from over 100 cases in which the obstruction was excised by means of a special instrument. It was found that the most common change was the occurrence of a comparatively newly formed connective-tissue layer immediately beneath the mucous membrane, forming a firm fibrous ring, associated with elevation of the median portion of the prostate. There was no underlying prostatitis and no connective-tissue infiltration of the sphincter muscle or of the gland tissue. The etiology of this type is the most difficult to determine.

The second group of cases as classified by Young is of almost equal frequency. In these specimens there was found, in addition to a submucous connective-tissue layer, a chronic inflammatory condition in the glandular tissue, often with marked periacinous infiltration, which occasionally extended into the muscle. This type is undoubtedly the one following a period of chronic prostatitis.

The pathology of the third and last group of cases bears out the original description of Home in 1811, and was verified by Lowsley in 1912. The latter proved the presence of middle-lobe tubules in 97 out of 98 specimens. Microscopically this third group shows typical hypertrophic glandular tissue, often associated with an inflammatory infiltration in and around the acini, which, if of sufficient duration, is accompanied by connective-tissue changes as in the second group. This hypertrophic glandular tissue is not from the lateral lobes, but is a proliferation of either (1) the suburethral group of gland acini lying beneath the mucous membrane of the vesical orifice inside the internal sphincter, and usually referred to as Albarran's glands, or (2) the subtrigonal group of glands lying beneath the mucous membrane of the trigone, and originally described by Home.

The frequency with which this type of bar obstruction occurs is remarkably high, as shown by recent observations. The combined figures show that in about one in every eight patients suffering from symptoms of prostatisme, there is not what has heretofore been universally considered to be hypertrophy of the prostate, but rather an atrophic gland with the obstruction due to the formation of a median bar.

The diagnosis of these conditions is by no means easy and may exhaust every means at the command of the surgeon. Catheter examination shows more or less residual urine, but it must be remembered that the amount found is not of necessity an index of the severity of the obstruction, and may be out of all proportion to its cause. It may also be found that the obstruction at the bladder neck requires the use of a special type of catheter, particularly the *coudé* or *bicoudé*. Digital examination of the rectum will exclude certain prostatic changes, notably cancer and simple hypertrophy. Cystoscopy will generally show not only the thickening of the posterior lip of the vesical orifice, but also the evidence of obstruction offered by trabeculation of the bladder wall.

From his own experience and from a study of the results obtained by others in these conditions, Randall says when the proper diagnosis is understood and its treatment correctly directed, the prognosis may be considered decidedly more favorable than in prostatic hypertrophy. In summarizing treatment, Randall's views are as follows:

The indications governing treatment clearly demand the removal of the obstruction. It has been repeatedly demonstrated that excision of the obstructing portion at the vesical orifice will allow complete evacuation of the bladder. To obtain this result a total prostatectomy is not warranted, both because of the age of the patient, which is often within the procreative period of life, but also because of the magnitude of the operative procedure. The remaining methods that may be advocated divide themselves into three classes:

1. The excision of the obstructing bar by means of Young's urethroscopic median bar excisor. In the hands of the originator of this instrument, this method has given brilliant results in the largest series of cases yet studied, and well deserves further and more extensive use. The danger from uncontrollable hæmorrhage has to be considered and offers the one objection to its use, though Young himself has never experienced it.

2. The obstructing bar may be attacked and severed by means of the galvanocautery incision, as advocated by Chetwood, or by using the Goldschmidt urethroscope, as recommended by certain Continental urologists. The latter method is sup-

posed to have the advantage over the former of not being complicated by the danger of hæmorrhage, and when thoroughly performed it should lead to a prompt cure of the urinary difficulty.

3. The third method, which at present seems likely to be the one of choice in the future, can hardly be classed as either an excision or an incision of the bar, but rather a destruction of the obstructing portion by means of the high-frequency fulgurating current. This is performed by the repeated application of the spark to the desired portion of the vesical orifice through the ordinary catheterizing cystoscope. Although this latter method is of decidedly recent development, so much so that statistics are as yet not forthcoming, it gives promise of superseding a more dangerous and a more radical operation.

G. J. THOMAS.

Spalding, C. B.: Prostatectomy. *Urol. & Cutan. Rev.*, 1916, xx, 20.

This paper deals with the physiological hypertrophied prostate which has been neglected, and the author therefore favors the two-stage operation. Under local anæsthesia suprapubic cystotomy is performed, and perfect bladder drainage established. This is preferable to frequent catheterization and irrigations. Immediate relief is obtained, and the shock is minimized. The reconstruction is then started.

The preparatory treatment varies between two and six weeks. The urinary output is carefully watched and bowel elimination established. These are the two most important objects and as they progress favorably so does the general physical condition. The second stage is then performed.

Chloroform is used as an anæsthetic in the very old, while gas-oxygen is more successful in patients with bronchial irritation. The previous incision is enlarged to admit two fingers. With a metal sound in the urethra for a guide and the left index-finger in the rectum, the gland is enucleated. Drainage is established by a catheter so fenestrated that the openings are in the prostatic urethra, while one end extends through the wound and the other through the penile urethra. This is supplemented during the first twenty-four hours with a "standpipe-tube," to which is attached a siphon. These tubes are kept free from clots. Later when the wound has closed around the catheter, it is removed and an ordinary retention catheter used. C. D. PICKRELL.

MISCELLANEOUS

Curtis, A. H.: Laboratory Diagnosis of Chronic Infections of the Urinary Tract in Women. *Internat. J. Surg.*, 1916, xxix, 12.

Chronic infections of the urinary tract can be best diagnosed by one who is actively engaged in clinical work, including cystoscopy and laboratory study. Careful correlation of clinical findings and laboratory methods, with extensive modifications in cultural technique to meet individual cases, is essential.

The source of even small amounts of pus in the urine should be investigated; the place of its formation should be definitely localized through the assistance of ureteral catheterization.

Persistent pyuria in the absence of a gross bladder lesion is almost invariably due to kidney disease.

In those frequent cases with bladder irritability which yield clear, bacteria-free urine, cultures from the traumatized urethral canal or from the introduction of a probe into Skene's ducts may demonstrate the cause of infection. When bacteria are widely scattered or grow with difficulty, a mixture of the urinary sediment with blood, followed by the making of a large number of ascites-blood-agar tubes, of high dilution, results in conditions favorable for the development and isolation of the bacteria present.

Experience teaches that the chief lesions in urinary tuberculosis are usually renal. In obscure cases laboratory diagnosis is facilitated by the use of potassium iodide, tuberculin, kidney massage, limitation of liquids, repeated examinations of fresh specimens after high power centrifugation, Petroff cultures, and injection of a series of medium-sized guinea pigs.

There is seemingly a tendency to lay undue stress on functional urinary tests at the expense of careful routine examination. H. W. PLAGGEMEYER.

Larkin, J. H., and Levy, I. J.: A Pathological Study of Syphilitic Aortitis and Its Serology. *J. Exp. Med.*, 1916, xxiii, 25.

The authors recognize the fact that the Wassermann reaction as a diagnostic factor in syphilis holds a unique position in clinical medicine. They recognize, however, that there is a wide difference of opinion in regard to the infallibility of this method of diagnosis. As in all other problems in medicine it is the work of the pathologist to demonstrate the probable focus of infection in an individual with a positive Wassermann reaction, in whom there is no clinical evidence of syphilis. With this in view it occurred to the authors to check the serological diagnosis on the autopsy table; that is, to find some definite pathological explanation for this type of reaction in so-called latent syphilis. Since syphilis primarily attacks the blood-vessels — in fact, it is regarded as a disease the manifold pathological changes of which have their origin in diseased blood-vessels — they turned their attention first to the aorta.

Approximately 50 cases were examined, and the results were summarized as follows:

Syphilitic aortitis is a productive inflammatory process, the earliest and most constant feature of which is a perivascular round-cell infiltration in the adventitia.

The typical gross picture of luetic aortitis is often obscured by a superimposed, diffuse atherosclerosis. In the early cases the aorta appears fairly normal, presenting only the characteristic histological changes.

A pure aortic insufficient valve, with the exception of an infectious endocarditis, is always luetic.

Cardiac hypertrophy is not a complication of luetic aortitis. When present it is usually associated with a nephritis.

The demonstration of spirochæta pallida, even in advanced specimens of syphilitic aortas, is doubtful.

An antigen prepared from the alcoholic extract of guinea-pig heart with the original Wassermann technique should be preferred in diagnosing luetic aortitis.

Positive complement fixations in patients suffering from syphilis for a period of about fifteen years or longer suggest the probability, at least, of histological luetic changes in the aorta in 80 to 90 per cent of the cases. Of these 60 per cent die from aortitis. About 94 per cent of patients suffering with aortitis give positive Wassermann reactions.

GEORGE E. BEILBY.

Haines, T. H.: The Incidence of Syphilis Among Juvenile Delinquents; Its Relation to Mental Status. *J. Am. M. Ass.*, 1916, lxvi, 102.

This article is based upon hundreds of Wassermann tests. The author's conclusions are:

1. No larger percentage of those yielding positive Wassermann reactions are defective in intelligence than in the general population of reform schools.

2. There was complete absence of evidence of the signs of congenital syphilis in 30 positive cases.

3. Cases of positive Wassermann with sister or father yielding a negative Wassermann point to an individual infection.

4. In a feeble-minded family of criminal tendency, and especially sexual offenders, father and daughter yielded negative serums.

5. The court charges against the girls in the majority of the cases, and the extent of sexual immorality, allow abundant opportunity for infection.

6. The absence of evidence of syphilis in the personal history and medical certificates can be given no weight, either for or against individual infection.

7. The absence or exaggeration of deep reflexes without difference in the two sides of the body, and without disturbance of the light reflex of the pupil, indicates that if these signs are due to syphilis of the nervous system, that they are early signs and so far tend toward evidence of individual infection.

H. A. KRAUS.

Englander, S.: Essential Hæmaturia. *Urol. & Cutan. Rev.*, 1916, xx, 16.

In an interesting review of the literature the author has obtained many different opinions concerning essential hæmaturia. Chronic passive congestion, tuberculosis, and the various lesions in nephritis are quoted as the causes of many of the symptomless cases of hæmaturia. Englander believes in essential hæmaturia and makes the diagnosis by careful exclusion. Roentgenography in stone cases, the examination of the eye-ground in nephritis with scanty or no urinary findings, focal reactions or animal inoculation for tuberculosis in which the bacilli have not been demonstrated and collargol pictures for new-growths and necrotic areas in infections are all routine procedures. If hæmorrhage is pathological the functional activity is decreased, while in essential hæmaturia the pthalein returns a normal output.

The treatment of hæmaturia depends upon the cause. If an operable case, the cause may be found which had not been localized during the examination. Harpster recorded a case caused by supernumerary arteries, which, when ligated, eliminated the hæmaturia. Edenbohl's stripping of the capsule in acute parenchymatous nephritis is usually sufficient. Mattress sutures usually stop the hæmorrhage in glomerulonephritis.

C. D. PICKRELL.

Lewis, B., and Bartels, L.: Caudal Anæsthesia in Genito-urinary Surgery. *Lancet-Clin.*, 1916, cxv, 28.

Lewis and Bartels speak very enthusiastically about their experiences during the past six months with caudal anæsthesia in operations upon the perineum, urethra, and bladder. In their article they review the history of this method, describe the anatomy of the sacral region, and give in considerable detail their technique. The solution which they use differs from that described by Harris in that they omit chloretone.

The failures have been few and have been due to causes which were avoided in later attempts. The danger of this method is almost nil, and it is far safer for old people or cases of cardiorenal disease or sepsis than are the general anæsthesias. Spinal anæsthesia they consider the most dangerous of all methods.

G. G. SMITH.

SURGERY OF THE EYE AND EAR

EYE

Mosher, H. P.: Operation for Draining the Lachrymal Sac and the Nasal Duct into the Unciform Fossa. *Laryngoscope*, 1915, xxv, 739.

Mosher describes his technique as used successfully by him in three cases of dacryocystitis in which he desired to establish intranasal drainage of the tear sac and nasal duct. He states that the operation is an outgrowth of observations made while curetting the anterior ethmoid cells, the nasofrontal duct, and the frontal sinus. Examinations of anatomic specimens following such work showed in most cases that the posterior half of the nasal duct was laid bare. This led to the thought that the duct could thus be approached and drained into the unciform fossa of the middle meatus.

The anæsthesia may be entirely local or may be a combined local and general anæsthetic. For convenience of description the operation is divided into six steps:

1. Removal of the anterior end of the middle turbinate. The punctum lachrymalis is dilated or preferably slit to admit a stiff probe which is carried through the canaliculus, the sac, and down the duct to the interior meatus.

2. Incision through the mucoperiosteum along the posterior edge of the ascending process of the superior maxilla. This cut extends from the attachment of the middle turbinate downward, stopping at the upper border of the inferior turbinate. The second incision is carried from the lower limit of the vertical incision back along the upper border of the inferior turbinate for one-half inch and then from the top of the vertical incision a second horizontal incision is carried across the upper limit of the unciform fossa. The flap thus outlined is raised and tucked backward and downward and so exposes the unciform fossa.

3. During this time the stiff probe has been in the nasal duct. Now with a proper curette an opening is gained to the lachrymal cell and then is brought outward and forward against the posterior edge of the ascending process of the superior maxilla. The curette is kept facing forward. Care is used not to remove the unciform process on account of the proximity of the antrum.

4. The stiff probe is withdrawn and when its point has escaped from the upper rim of the inferior turbinate, pressure is made inward with its point. A break is thus made through the inner wall of the nasal duct, and into the unciform fossa. The point is then advanced into the cavity of the nose and then the probe is swung upward, thus laying open the inner wall of the nasal duct from the inferior turbinate upward into the sac leaving only two or three millimeters of sac wall not rent through.

5. The stiff probe is then re-introduced and the operator curettes along the whole length of the posterior surface of the ascending process of the superior maxilla.

6. The probe is withdrawn and the nasal duct widened by biting off the anterior part of the inner wall of the duct which is composed of the ascending process of the superior maxillary bone.

A ligature carrier of special design is passed from the nose out through the slit or dilated punctum and armed with a ligature. The carrier is withdrawn and a piece of gauze is attached to the nasal end and drawn up into the nose, thus holding the flap that has already been replaced where it is desired to cover denuded bone. The end of the ligature coming from the punctum is fastened on the brow with adhesive plaster.

The after-treatment is the same as that following most nasal operations.

The author states that this operation is like all others in that one faces the danger of having a final narrowing or closure of the duct, but that this may be overcome by a reslitting of the duct.

J. S. Clark.

Duane, A.: Torticollis Relieved by Tenotomy of the Inferior Oblique. *Arch. Ophth.*, 1916, xlv, 33.

Duane cites a case of head tilting due to the effort to avoid diplopia, and relief by tenotomy of the overfunctioning muscle of the secondarily deviating eye. He describes the technique of the operation and refers to several types of cases.

A girl aged 3 years and nine months had tilted her head to the right shoulder since the age of four months. Orthopedic apparatus and massage gave no relief. When the head was straightened by a brace the left eye deviated upward; on bandaging the left eye the head immediately became straight. When the head was tilted in the desired position there was about 10° of left hyperphoria; with the head straight there was more than 20° of left hyperphoria. The diagnosis was congenital insufficiency of the right superior rectus, fixation with this paretic eye, and sharp secondary deviation upward of the left (sound) eye. Tilting of the head brought the images more to a level. Duane did a complete tenotomy of the left inferior oblique at its origin, with the result that the head remained practically straight, only a few degrees of hyperphoria remaining.

There are two important indications for this operation: paralysis of the superior rectus (congenital or traumatic) with secondary deviation of

the inferior oblique of the opposite eye, and paralysis of the superior oblique with secondary deviation of the inferior oblique of the same eye. In such cases the individual may shut one eye, but this is tiresome; he may converge or diverge enough to separate the images so far that one is ignored; or he may tilt the head. The latter is the most likely occurrence. Duane advises incision at the intersection of the lower orbital margin with a perpendicular dropped from the supra-orbital notch, cutting through the orbital septum close to the margin, and keeping close to the floor of the orbit with the strabismus hook passed up and in close to the origin of the muscle. EMORY HILL.

Smith, H.: Conjunctival Flaps in Cataract Operations. *Indian M. Gaz.*, 1916, li, 11.

The execution of the conjunctival flap is facilitated by the ballooning of the conjunctiva upon a solution of cocaine and adrenalin.

Stanculeanu's flap is made by a pericorneal incision of the conjunctiva of about half its circumference, diverging at either extremity sufficiently to allow the insertion of a suture, which when tied draws the distal lip of the conjunctival rent down over the upper border of the cornea. Its chief advantage over other flaps is claimed to be that it maintains by pressure close apposition of the sclerocorneal wound. Smith enumerates these disadvantages: the time required, adhesions of its border to the sclerocorneal wound resulting in serious complications, increased traumatism, and increase of the danger of loss of vitreous. It is, however, the best flap operation, since it allows the operator a fair chance to deal with complications.

The free border flap made by dissecting up a flap of conjunctiva at the upper limbus and carrying the sclerocorneal incision underneath its attached margin has been entirely discarded by the author for the following reasons: primary and secondary hæmorrhage — obscuration of the operation field resulting in faultily placed incision, delayed healing, late infection, high astigmatism. The making of the flap as a part of the sclerocorneal incision is neither easy nor satisfactory.

Czermack's flap and modifications which consist essentially in a preliminary conjunctival incision through which the membrane is undermined to the limbus. Through this opening an incision is made, partially with the knife and partially with the scissors. These flaps do not permit the intracapsular operation as they do not give sufficient room. They are difficult to execute, are painful, and heal badly. W. REEDER.

Aubineau, E.: Embedding the Nasal Canal in the Treatment of Dacryocystitis (L'effondrement du canal nasal dans la cure de la dacryocystitis). *Arch. d'opth.*, 1916, xxxv, 33.

Suppuration of the lacrymal sac is a constant danger to the eye. It is therefore important to seek a rapid and radical treatment. The operation now in use against dacryocystitis consists in either ablation of the sac or destruction of the sac. The author prefers destruction of the sac and has practiced that method for ten years; but this procedure is itself insufficient unless completed by the embedding of the nasal canal to provide an effective drainage through the nasal fossæ. This latter systematic embedding characterizes his operative treatment.

The operation is divided into four parts: (1) opening the site of the sac; (2) curretting of the walls of the sac and the débris as well as the surrounding tissue; (3) seeking out the nasal canal; (4) embedding of the bony nasal canal which ought to penetrate into the nasal fossæ; use of gauze tampons and light compress dressing. A. GOSS.

Allport, F.: State Legislation Concerning Ophthalmia Neonatorum, *Ophthalmol.*, 1916, xii, 276.

The author gives a comprehensive review of recent state laws with the following résumé of very important facts:

1. Ophthalmia neonatorum is responsible for 20 per cent of the blindness in the United States.
2. It costs $400 per year to educate a blind child as compared to $30 to educate a seeing child.
3. There are about 50 blind schools in the United States costing about $2,000,000 to maintain.
4. Ophthalmia neonatorum costs $7,000,000 yearly in the United States.
5. The use of the Credé method of prophylaxis would entirely eliminate ophthalmia neonatorum.

EMORY HILL.

Norris, E. J.: Tuberculosis in Its Relation to Eye Diseases. *Med. Fortnightly*, 1916, xlviii, 1.

After a discussion of tuberculosis in general, the author expresses a belief that there are tuberculous conditions in the eye other than the typical ones described. In support of this view he reports two cases.

The first case was persistent recurrent trachoma which was treated for more than a year by the usual methods with little permanent result. The cornea was extensively involved. Tuberculin treatment and systemic injections produced remarkable improvement.

The second case was a child of seven years with a phlyctenular ulcer of the cornea. Recurrences had occurred over a period of several months. The condition was cured and remained so after tuberculin treatment. E. B. FOWLER.

Lister, A. E. J.: Injuries to the Eye Resulting from Accidents at Polo. *Indian M. Gaz.*, 1915, l, 451.

Lister reports two cases of injury to the globe by blunt force. The first case was the result of a blow by a polo stick, causing an optic neuritis without definite injury. The condition was long-standing and clear vision had not returned after several months. The author concludes that there was some damage to the optic canal.

In the second case an injury from the same cause

resulted in a subluxation of the lens and repeated attacks of secondary glaucoma. The author feels that complete rest rather than the eserine used was the important factor in controlling this increased tension. E. B. FOWLER.

Worth, A. C.: Treatment of Iritis. *J. Ophth., Otol. & Laryngol.*, 1915, xxi, 750.

In iritis mydriasis must be the first object of the treatment. Without measures tending to reduce inflammation no action from the use of atropine can be expected to occur for at least several hours. Massive doses are recommended, oftentimes the powder is employed, commonly two or four per cent with dionin, and the subconjunctival injections of atropine have given good results. Instillation is insisted upon with the same regularity during the night as in daytime; night is regarded as an especially dangerous period. Also, proportionately more atropine is necessary while dionin is being employed, because it is believed that dionin brings about a quicker elimination of the atropine along with the inflammatory products.

Also, in iritic inflammations accompanying degenerating corneal conditions, more atropine is necessary to ensure constant mydriasis, because less is absorbed by reason of the altered condition of the cornea.

Dionin is atropine's first assistant in that it is a powerful analgesic and lymphogogue. It is held that the subconjunctival injection of salt solution exerts a powerful releasing action when the synechiæ posterior are fresh. By the use of this routine the author has frequently observed a change in exudative processes which enables dilatation to take place.

The treatment of iritis is not for the time being, but for the rest of the patient's life — one can never be sure that a recurrence will not occur.

G. D. THEOBALD.

Kalt: Technique of Covering Wounds of the Cornea with Conjunctiva (Sur la technique du recouvrement conjonctival de la cornée). *Ann. d'ocul.*, 1916, cliii, 23.

Covering with conjunctiva is the most effective way of treating wounds of the cornea, provided of course they are not infected and there is no foreign body remaining in the eye. It should be done as soon as possible after war wounds, and the fact that there is a possibility of infection should not act as a deterrent. There is little danger of its being followed by panophthalmia or iridocyclitis, and if it becomes necessary the eye can be removed later. If the wound is not infected this method is the surest protection against secondary infection. But to be effective the wound should be covered for several weeks, while as a rule, with the technique ordinarily used, the wound is uncovered in a few days. This is due to the fact that most operators make a purse-string suture. The inner bleeding surfaces of the conjunctiva are rarely applied to each other all around the orifice, so adhesion does not take place and a small opening is left, which nullifies the value of the procedure. Moreover, while the conjunctiva is easily brought from the upper and lower culs-de-sac there is considerable resistance from the sides; therefore the suture should be horizontal.

After the eye is anæsthetized with cocaine a circular incision is made; it is then brought forward with small forceps, one at each extremity of the horizontal diameter, so that the circular opening is transformed into a horizontal cleft. The two surfaces are then applied to each other and sutured with very fine sutures. This will keep the cornea covered for a month, when the conjunctiva should be clipped with scissors leaving the cornea uncovered again. This allows time for the healing of the wound. The sutures are removed about the tenth day. A. GOSS.

Riesman, D.: Soft Eyeball in Diabetic Coma. *J. Am. M. Ass.*, 1916, lxvi, 85.

Riesman reports a case of diabetic coma with marked reduction of intra-ocular tension. Some interesting observations appear in the literature in regard to clinical observations and animal experiments. Heine (Heidelberg) goes so far as to say that a soft eyeball in a patient in coma proves the coma to be diabetic. The author does not believe sufficient data has been accumulated to make this certain. E. B. FOWLER.

Terrien, F., and Ledoux-Lebard, R.: Extraction of Foreign Intra-orbital Bodies Under the Intermittent Control of the Fluorescent Screen (L'extraction des corps étrangers intra-orbitaires sous le controle intermittent de l'écran). *Arch. d'opth.*, 1916, xxxv, 35.

The authors report three cases in which small intra-orbital foreign bodies were removed successfully. In two of these cases previous attempts at extraction by competent specialists failed, but the authors by using the radiographic method located and extracted the foreign bodies. They recommend this method of location in all cases where small intra-orbital foreign bodies must be removed.

A. GOSS.

Illig, H.: Local Anæsthesia in Exenteration and Enucleation of the Eyeball with Novocaine. *Arch. Ophth.*, 1916, xlv, 46.

After experimenting with various combinations of novocaine, adrenalin, and potassium sulphate for local anæsthesia following hypodermic injection of scopolamine and morphine, Illig fixed upon the following: omit the hypodermic except in very excitable patients (three-fourths hour before operation); one drop of a 5 per cent cocaine solution 25 to 20 minutes, and again 20 to 15 minutes, before operation. Three to five minutes after the second drop of cocaine (at least 12 minutes before operation) make a deep injection of the novocaine mixture at the inner and at the outer canthus.

Illig uses a tablet containing 0.02 gr. novocaine and 0.00005 gr. adrenalin in 6.5 ccm. sodium chloride

potassium sulphate solution (7 NaCl: 4 K_2SO_4: 1000 distilled water); this solution is then boiled for a few minutes. This 3 per cent novocaine is found sufficient generally; occasionally 4 or 5 per cent is used. The patient should be lying down so that the solution comes in contact with the ciliary ganglion and does not seep forward. A straight platin-iridium needle 4 cm. long and 0.4 to 0.6 mm. thick is used with a syringe holding 3 to 5 ccm. The injection at the temporal side is made at the outer canthus; the nasal puncture is made just above the caruncle. The needle passes straight back 1 cm., then is directed so as to pass behind the eyeball (3 to 3.5 cm.). One and a half ccm. of the solution is injected slowly. Illig has seen no discomfort or ill effect resulting from the use of this method.

EMORY HILL.

Kerry, R.: Note on the Use of Iodine in Diseases of the Eye. *Ophthalmol.*, 1916, xii, 327.

Kerry thinks that iodine given hypodermically is a valuable remedy in numerous eye diseases, especially keratitis, scleritis, and uveitis. He gives 10 minims of a 2.5 per cent solution of iodine in a fatty combination, making the injection in the flank once or twice weekly. He offers no clear explanation of the good results, but thinks this method effective while free from the difficulty of the local use of iodoform. EMORY HILL.

Clarke, E.: Some Rare Ophthalmic "War" Cases. *Med. Press & Circ.*, 1916, c, 604.

Clarke reports three cases of war injury. In the first a nickel bullet struck a spade and splintered into minute fragments, some of which struck the patient's eyes. One month after the injury, with no ocular treatment, there was a small corneal opacity and many dust-like particles of nickel in the cornea and a small piece of the same metal superficially located in the lens. Vision was 6/9 with no change after continued observation, so no treatment was undertaken.

In the second case there was complete evulsion of the globe caused by a shell explosion.

In the third case, as a result of a concussion blow, the externals being uninjured, there was a complete detachment of the retina as diagnosed pathologically after the removal of the globe. E. B. FOWLER.

Saint-Martin: Ocular Surgery in an Ambulance at the Front During the First Year of the War (De la chirurgie oculaire dans le ambulances de l'avant au cours de la première année de la guerre). *Ann. d'ocul.*, 1916, cliii, 7.

Eye injuries are comparatively rare in the war, constituting about 3.63 per cent of the number of wounds. The medical affections of the eye are almost entirely ordinary conjunctivitis. Among the eye wounds the most numerous and most serious are penetrating wounds of the eyeball. The prognosis of these cases is rendered much worse by the fact that a foreign body often remains lodged in the eyeball, which makes enucleation necessary sooner or later. This is the reason why it is of such great importance to have a skilled oculist at the front, furnished with a radiographic apparatus for locating foreign bodies and an electromagnet for extracting them at once. If this is delayed until the wounded are evacuated it increases the danger of infection and loss of the whole eyeball very materially.

A. GOSS.

Verhoeff, F. H.: Histological Findings After Iridotasis. *Arch. Ophth.*, 1916, xlv, 5.

Verhoeff reports the anatomic findings in an unsuccessful iridotasis operation for the relief of glaucoma explaining the failure to produce permanent benefit. The operation, devised and practiced with remarkable success by Borthen, consists of a keratome incision through the corneoscleral limbus beneath a large conjunctival flap. The iris is drawn between the lips of the wound, some traction exerted upon it, and it is left protruding beneath the flap. The pigment epithelium of the iris should prevent adherence to the anterior lip of the wound and allow drainage from the anterior chamber to the subconjunctival tissues. Additional effects may be the freeing of the filtration angle and opening of the iris crypts from the stretching of the iris. Simple chronic glaucoma is the most favorable type of the disease for this procedure.

Verhoeff's case was of this type, with recent inflammatory symptoms and blindness. For several weeks after operation there was entire relief and normal tension; then pain recurred and the eye was enucleated. Microscopically the iris lined a cyst-like space between the lips of the wound bulging into the episcleral tissues, which showed a proliferation of connective tissue. The sphincter of the iris was at the summit of the cyst, having been displaced presumably by the stretching to which the iris had been subjected. The apposition of the iris to the adjacent tissues precluded drainage. Verhoeff suggests a small iridectomy, as Borthen has lately practiced, but including the sphincter, so that further pulling upon the iris may not draw it within the corneoscleral wound. A possible disadvantage of the iridectomy would be an inflammatory reaction closing off the filtration area. EMORY HILL.

Valude, E.: Method of Enucleation (Procédé d'énucleation). *Ann. d'ocul.*, 1916, cliii, 68.

Owing to the number and nature of wounds of the eye caused during the war and demanding enucleation, Valude describes the procedure adopted. Three instruments suffice: a separator, a forceps with wide blades, and strong curved scissors.

The separator being placed or, better still, an assistant holding the lids far apart with a Desmarres instrument, the operator, holding the forceps in the left hand, seizes the eyeball, the forceps blades being planted in each side of the cornea. With the curved scissors the cornea is circumscribed by a rapid section of the mucous at 2 or 3 mm. from

its edge. Without any other instrument the right external muscle is then attacked. This is easily found owing to the traction exercised by the forceps. The muscle is sectioned and through the breach the scissors are passed as far as the optic nerve, which is also sectioned. With one blade of the scissors inside and the other without, the other muscles and fibromucous attachments are easily sectioned from behind outward. The operation is completed within one minute, and under one whiff of chloroform. A. Goss.

Curdy, R. J.: The Operative Treatment of Squint. *J. Mo. St. M. Ass.*, 1916, xiii, 16.

After touching on the improvements in non-operative treatment Curdy discusses the results and uncertainties of tenotomy and advancement in various forms. His own preference is for a relatively simple suture put into the tendon margin through the conjunctiva (one above and one below), carried forward and inserted parallel to the corneal margin, this being done before the tendon is excised. A suture is placed in the opposing muscle and episclera so that when a complete tenotomy is done the tendon will be lengthened an amount equal to the opposite shortening. Tendons are cut and sutures tied, the eyes being bandaged for a period.

A very definite statement is made by the author to the effect that only the anatomical and never the functional portion of the squint should be surgically corrected and substituted for non-operative treatment. E. B. Fowler.

EAR

Lawrence, L. A.: Total Occlusion of the Right External Auditory Meatus. *Proc. Roy. Soc. Med.*, 1915, ix, *Otol. Sect.*, 5.

This condition was noticed in a woman, aged 31. The right meatus was occluded by a smooth partition stretching completely across the meatus about a third of the depth from the surface. Careful examination failed to show any opening whatever. There was no moisture or discharge on the surface. No other deformity was found. The eustachian tubes were patent. Râles were heard through a passed eustachian catheter on both sides. The left ear was normal. The patient could hear an acoumeter two inches from her right ear. Weber's test was indeterminate. Rinne's test showed the right ear −, left ear +, Schwabach neutral. The author thinks the condition congenital. Otto M. Rott.

Wilson, J. G., and Pike, F. H.: The Differential Diagnosis of Lesions of the Labyrinth and of the Cerebellum. *J. Am. M. Ass.*, 1915, lxv, 2156.

The authors discuss three symptoms common to lesions in the labyrinth and in the cerebellum: nystagmus, vertigo, and ataxia. Sufficient data is presented to make possible a differential diagnosis between the pure labyrinthine and the pure cerebellar cases.

Concerning nystagmus it is stated that the cerebellar differs from the labyrinthine form (1) in uniformity of direction and (2) in character.

In labyrinthine lesions the slow deviation is always to the side of the lesion; while in cerebellar disease, it may be away from the side of the lesion, depending on whether the lesion is irritative or destructive; and it tends to be irregular in the plane of its direction with the head at rest.

As for the character of the nystagmus, the authors reaffirm their previous assertion that the cerebellar form is essentially ataxic; it is oscillatory, approaching toward an ataxia of the eye muscles. With the animal at rest it was found to lessen or even disappear. It is increased by fixation, tending to diminish behind glasses when the patient ceases to focus.

Concerning ataxia, it is stated that labyrinthine lesions differ from cerebellar (1) in the existence of Romberg's sign in labyrinthine lesions. (2) Variations in the attitude of the head influence the lack of equilibrium of the body in labyrinthine and not in cerebellar lesions. (3) An affection of the labyrinth does not definitely involve those movements of isolated parts which result in dysmetria. (4) In labyrinthine disease movements of rotation or disorientation are not so readily perceived.

Otto M. Rott.

Kopetzky, S. J.: Some Clinical Aspects of Sinus Thrombosis with Special Reference to Pathology. *Am. J. Surg.*, 1916, xxx, 1.

From a study of twenty cases of sinus thrombosis, the author concludes that the type of mastoid lesion is an important factor in determining the gravity of a given case of sinus thrombosis and that the hæmorrhagic type presents secondary complications more frequently than do other types of mastoiditis.

He believes that the normal appearance of a sinus wall is no indication as to the presence or absence of a thrombosis of the sinus and that the internal jugular should be resected in spite of a normal appearing sinus wall and no evidence of a clot where septic temperature continues and a positive blood culture is found; or with the advent of abscess formations in muscles or joints or endocarditis without positive blood culture.

Secondary lesions, excluding meningitis, while aggravating the gravity of the prognosis, do not necessarily mean a fatal prognosis.

Ellen J. Patterson.

Andrews, A. H.: Brain and Sinus Complications of Otitis Media, with Special Reference to Symptomatology. *J. Ophth. & Oto-Laryngol.*, 1916, ix, 383.

The author divides the intracranial complications into three general classes: meningitis, abscess, and sinus thrombosis.

Meningitis can be of either the purulent or the serous type, and each of these may be general or local.

Abscesses may be extradural, just within the dura, or deep within the tissue of the brain itself.

Besides stating the symptoms found in typical cases of meningitis, abscess, and thrombosis, the author discusses those symptoms common to the three affections, but dwells on the differential points.

The variations of the following symptoms and signs are thus presented:

Headache, temperature, pulse, special sinuses, fundus signs, chills, vomiting, skin and muscle reflexes. OTTO M. ROTT.

Lewis, W. W.: Apoplexy of the Internal Ear. *St. Paul M. J.*, 1915, xvii, 820.

The author discusses such primary affections of the internal ear as hæmorrhage, inflammation, hyperæmia, sudden anæmia, concussion, subjection to intense sound and atmospheric conditions, heat stroke, and tonic states from drugs or constitutional disease (pernicious anæmia and leukæmia). The symptoms indicative of such an affection are either of the irritative or the paralytic type and cochlear or vestibular according to which branch is affected.

The irritative symptoms are tinnitus and hyperæsthesia if of cochlear origin, and dizziness, nystagmus, and disturbance of equilibrium if of vestibular origin. The paralytic symptoms are hardness of hearing or deafness if of cochlear origin and loss of reaction of labyrinth when experimentally irritated. If, however, there has been a sudden destruction of the labyrinth, there are irritative vestibular symptoms due to an over-balance from the opposite side, and lasting until compensatory balance is established. OTTO M. ROTT.

Welty, C. F.: Mastoid Operation Dependent upon Pathology. *Calif. St. J. Med.*, 1916, xiv, 25.

The author advises the simple mastoid operation in most cases in children under 15 years of age who have had discharging ears for one year or more.

The contra-indications to the simple mastoid operation in chronic suppurative otitis media in children under 15 years of age are:

1. Those that may be present prior to operation as: (*a*) acute exacerbation of chronic suppuration associated with cerebral symptoms; (*b*) vertigo, nausea, and vomiting, nystagmus, or facial paralysis; (*c*) by ear examination, acute or chronic labyrinthitis, or destruction of the labyrinth, fistulæ of the labyrinth, or a case that will react to the fistula symptom, also partial or complete destruction of the tympanic wall, true cholesteatoma.

2. Those that are found during the operative procedure: (*a*) cholesteatoma; (*b*) fistulæ of the semicircular canals; (*c*) such extensive bone disease of the walls of the attic and antrum that it cannot be removed with certainty. OTTO M. ROTT.

Lubman, M.: Syringing the Ear. *N. Y. M. J.*, 1916, ciii, 71.

The author calls attention to the fact that water acts as an irritant on chronically inflamed tissue and that, therefore, it has a very limited field in ear work.

Syringing the ear is never of benefit in chronic diseases, and positive harm is often done by aggravating the pathological conditions present. He reasons by analogy with fistulous conditions in other parts of the body and mentions eczema specifically as being made worse rather than better by the action of water. Syringing may be good for certain aural conditions but it must not be forgotten that pathological conditions change, the disease progresses, and other therapeutic remedies may be used.

The contention of the author that syringing cannot be beneficial in acute and chronic catarrhal conditions of the middle ear needs no argument for its proof, since the origin of the trouble is in the eustachian tube. Syringing in acute suppurative otitis media is permissible since it allays pain and the water softens and ripens the tissues, thus conducing to spontaneous rupture or preparing the way for incision. It also acts as a cleansing agent and helps to absorb the œdematous areas. The use of water should be discontinued when the acute stage has passed and dry wipes substituted to avoid too much softening and a consequent external otitis. If the disease has progressed to the chronic form, water is contra-indicated and unsurgical. It is useless and aggravates the condition by irritation. The excessive growth of granulation tissue is retarded by dryness, encouraged by moisture.

G. M. COATES.

Large, S. H.: Conservatism and Radicalism in Surgery of the Ear, Nose, and Throat. *Cleveland M. J.*, 1916, xv, 25.

In reference to tonsillectomy, the author is in favor of enucleation only when there is a definite indication present. He thinks that too many are enucleated without this indication.

Because of the fact that 75 per cent of aural diseases are caused by diseases of the nasopharynx, diseases in this region should be treated radically. Particular reference is made to adenoids and hypertrophies of the posterior ends of the inferior turbinates.

Conservative treatment of the turbinates is advised, except where the middle turbinate has to be sacrificed in order to properly treat or operate on the sinuses. For nasal obstruction, septal resection is more frequently indicated than turbinectomy.

Delay in incising the ear drum in acute otitis media is condemned and if an aural discharge continues longer than three weeks the mastoid cells and antrum should be opened; and if the discharge still persists after another six weeks, some form of the radical operation is advised.

In order to prevent deafness a yearly examination of all patients is advised.

In malignancy of the larynx it is better to err on the side of radicalism than to risk failure by conservative methods. OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Wishart, D. J. G.: The Origin of the Naso-antral Polyp. *Canad. M. Ass. J.*, 1916, vi, 7.

The author refers to that type of nasal polyp which is solitary, confined to one side of the nose, and extending with the postnasal space, the origin being in the maxillary antrum.

After referring to the reports of Killian (22 cases) and Brown Kelly (15 cases), the author reports 6 cases, in 4 of which the radical antral operation was performed, thus demonstrating the antral origin of the polypi and rendering this point of attachment accessible to currettage and the application of trichloracetic acid.

The pedicle consisted of a thin band having a very limited point of attachment generally on the posterior or outer wall near the back. The area of attachment was never more than one-half inch, and usually only half that area. OTTO M. ROTT.

Jones, E.: The Relation of Nasal Disease to Headache. *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 76.

Headache may be caused by the following nasal conditions:

1. Swelling of the mucosa with pressure or irritation of the nerves.
2. Direct contact of the swollen mucosa.
3. Stasis following obstruction of the drainage passages.
4. Negative pressure in the sinus.
5. Re-absorption of toxins formed within the sinus.
6. Ulceration of the mucosa with involvement of the nerves.
7. Any condition which causes active congestion of the cranial circulation, as overindulgence in alcohol, tobacco, etc.

The character of the pain in the various affections is summarized as follows:

1. The pains from nasal affections may be of the most varied kinds.
2. Facial neuralgia and migraine are often due to disease within the nasal accessory sinuses.
3. Headache in the supra-orbital region with superficial tenderness over the painful areas is usually due to pressure from hypertrophy of the middle turbinate.
4. Headache is one of the most common symptoms of sinus disease. When due to the maxillary sinus, there is a full tense feeling over the superior maxillary region of the affected side or pain pressing upward to the outer angle of the eye.
5. Headache in acute frontal sinusitis is present from the very beginning of the disease, first over the affected sinus, later in the vertex, temporal, or occipital regions.
6. In anterior ethmoid diseases there is pain between the eyes; when behind the eyes and nose there may be trouble with the posterior ethmoid cells.
7. The headache in sphenoidal disease is most excruciating within the head and through the temples or occipital regions. OTTO M. ROTT.

Ridpath, R. F.: The Upper Respiratory Passages in Habitual Users of Cocaine and Heroin. *Laryngoscope*, 1916, xxvi, 53.

The author draws the following conclusions from an examination of 21 patients:

1. The constant use of heroin or cocaine upon a mucous membrane produces a greatly swollen and congested condition, and this is followed by atrophy and anæmia of all membranes involved.
2. Chronic users of these drugs do not have the same amount of "catarrhal" affections as people not addicted to its use.
3. The sensibility of the mucous membrane is not affected.
4. Perforations of the septum are not directly due to the drugs used, but when present may be accounted for by a history of constant pricking, abrasion of the mucous membrane by the fingernail with consequent perforation.
5. Cocaine and heroin used in this manner do not produce anosmia.
6. The drugs are absorbed by the mucous membrane of the larynx as much as, if not more than, by the mucous membrane of the nose. This is shown by the constant atrophy of the mucous membrane and the engorgement of the vessels of this part.
7. Heroin produces a thin acrid discharge. Cocaine causes epistaxis. OTTO M. ROTT.

Opdyke, R.: Frontal and Maxillary Sinusitis and Sequelæ Due to Staphylococcus Pyogenes Albus. *Med. Rec.*, 1916, lxxxix, 18.

The author reports a case wherein a series of severe and obstinate involvements, extending over a period of several months, were due to the staphylococcus pyogenes albus alone and necessitated 21 operations, with complete recovery.

The patient was a man 18 years old who since childhood had had acute articular rheumatism, a mitral lesion, minor attacks of tonsillitis, and acute pharyngitis. He developed acute maxillary sinusitis on the left side. The antrum was drained and the staphylococcus pyogenes albus isolated. Two days later there followed a severe attack of tonsillitis on the left side with quinsy. The abscess

was drained and an autogenous vaccine given without result. Several days later a swelling followed on the left side of the neck. On opening the abscess a direct communication was found to exist between the tonsil and sinus. Slight improvement followed with the exception of pain in the left arm and right thigh. The sinus was aspirated with negative results.

About three weeks later the left frontal sinus was curetted for left frontal headache with prompt relief of symptoms. About two weeks later occipital headache and insomnia developed. The left inferior turbinate bone had sloughed off.

A few weeks later signs of intracranial pressure developed and a decompression operation was performed. Three drams of seropurulent fluid (staphylococcus pyogenes albus) were drawn from the fourth ventricle. Improvement lasted one month when another decompression operation was performed. A considerable portion of the parietal, occipital, and temporal bones were resected and thirty minims of fluid aspirated from the fourth ventricle. The constitutional and local symptoms slowly subsided.

Another extensive operation on the frontal sinus was performed on account of sudden severe frontal pain. The patient made an uneventful recovery with the exception of an attack of quinsy. The tonsils were removed and the patient is at present enjoying perfect health. H. A. Potts.

Mundt, G. H.: Focal Infections of the Accessory Nasal Sinuses. *Illinois M. J.*, 1916, xxix, 38.

Focal infections of the nasal sinuses cause: (1) local troubles, as headache, muscular or accommodative asthenopia, contracted visual field; and (2) general troubles, as the various varieties of arthritis.

To recognize an offending sinus it is not enough to rely on the patient's statement as to whether he has nose trouble or whether there is pain on pressure over the sinuses. Otto M. Rott.

Goddard, H. M.: Deflected Septum as a Causal Factor in Sinus Diseases. *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 52.

The author thinks that the cartilaginous deviation gives more trouble than it is usually credited with, and frequently the deviation is of such a moderate degree as not to give rise to nasal obstruction and consequently is often overlooked. The trouble is caused by the deformity obstructing secretion, which then undergoes putrefactive changes.

The author cites two cases in which submucous resection permitted the sinus infection to clear up under appropriate treatment. Otto M. Rott.

MacWhinnie, A. M.: The Treatment of Infections of Accessory Sinus. *N. Y. M. J.*, 1916, ciii, 213.

For two years the author has used the following in acute and chronic purulent ethmoiditis:

Application of antipyrine, 4 per cent solution, or adrenalin with cocaine, 3 per cent solution, to the ethmoid region, allowing the pledgets to remain in place until there is complete shrinkage; application of the author's suction pump with from five to twenty inches of vacuum; injections directly into the ethmoid cells by means of a very fine pipette of a 50 per cent solution of argyrol, 2 ccm. This procedure is carried out daily or on alternate days, depending upon the amount of the reaction, six to twelve treatments usually being sufficient.

In the chronic mucopurulent types, treatment is necessary at first every day and then two or three times a week for three or four months.

Where the hæmoglobin index is below par, the patient is built up with hypodermic injections of iron and arsenic. When the hæmoglobin index is normal, one-twelfth grain of bichloride of mercury in normal salt solution is injected intravenously every other day.

Every patient receives three times a week one capsule of the following mixture after the evening meal: extract of ox-gall 5 gr., calomel 0.5 gr., regardless of whether the bowels move every day or not. The patient's diet is regulated for a period of three days, as it is important that the ration be properly balanced. Otto M. Rott.

MacFarlan, D.: Notes upon the Aids to Antrum Diagnosis. *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 12.

Pain and tenderness, and the presence of pus in the nose are of value in diagnosis. Puncture is of great value and should be used more as a routine measure. Concerning transillumination, the following points are important:

1. The light must be powerful.
2. The examining room must be absolutely dark.
3. The light thrown out through the cheeks must be cut down by covering this area with a folded towel or with the hand.
4. A heavy piece of tubing over the lamp is essential.
5. The lips must be tightly closed around the base of the light.
6. The examiner should stand in front of and above the patient, who is seated on a low stool. The patient's eyes should be opened widely, looking up at the examiner.
7. A comparison of the two sides is essential.
8. The pupils should not be expected to light up in all cases; rather the light arc under the lower lid should be looked for.
9. It should be remembered that shadows from old antrum troubles persist.

Concerning X-ray, other diagnostic means are much handier and simpler except for (1) outlining the size and shape of the sinus, (2) in determining the position of the antrum floor, (3) in determining the relation of the teeth to the floor, and (4) in establishing involvement of other sinuses. The probe and the nasopharyngoscope are useful accessories in any examination. Otto M. Rott.

Simpson, J. H.: The Treatment of Deflected Nasal Septa. *Am. J. Surg.*, 1916, xxx, 5.

Operation is contra-indicated in the very old, in the very young whose facial bones have not attained full growth, and in patients suffering from acute middle ear or pharyngeal lesions, syphilis, tuberculosis, or other grave general disease.

The author considers submucous resection of the septum as a simple procedure to be done with local anæsthesia, and when properly performed under aseptic technique should develop neither complications nor sequelæ.

He emphasizes the importance of careful nasal examination both external and internal as a routine measure, especially where there is a history of previous trauma, and advocates the use of an intranasal splint rather than adhesive plaster to maintain correct apposition of the fragments.

ELLEN J. PATTERSON.

Morales, A.: Rhinoplasties (Rinoplastias). *Rev. méd. de Sevilla*, 1916, lxvi. 5.

The author describes the case of a man who was bitten by a horse, and a piece of his left nostril torn off. The wound after cicatrization left an extensive mutilation of the face. Fearing operation he ordered an artificial nose, a piece of metal painted to match his skin. The metal piece was applied and was supported by a collodium compound. When his skin would get red a marked contrast occurred between the skin and the artificial nose piece, so he finally agreed to an operation. The operation consisted in refreshing the margins in a beveled shape and forming a flap of the cheek, so as not to produce an ectropion, and according to the Indian method suturing it over the smaller inversion of the pedicle. The operation proved successful.

The second case described was an extensive epithelioma in the nose. The author performed two autoplastic operations, which proved unsatisfactory. After the first relapse the second followed with greater rapidity than the first. There was no other alternative but the removal of the nose with its entire skeleton. The result of the operation with the cicatrix, gave the patient a most repulsive aspect. A nose was made of aluminum, painted to match the skin. The nose was attached to a pair of spectacles with plain crystals, the nose being soldered at its upper extremity to the eye-glasses. The nose looked perfectly natural, as its upper margin was perfectly adjusted.

The most important point in rhinoplasty is the bony frame. In tertiary syphilis, as it attacks mostly the bony system and produces necrosis, it is most difficult to obtain as favorable results as when the disease is of a scrofulous origin. In such cases the author performs rhinoplasties on the double plan, combining the flap of the French method with the Indian one. He has not been able to use a metal nose frame, as he thinks it difficult to maintain asepsis in the region of the nose, prominent and exposed as it is to all sorts of conditions.

The case is reported of a man 28 years old, who attempted suicide by discharging the barrel of his gun under his chin, destroying a portion of his right nose. The interesting thing about this case was that the gun was charged with bird-shot, and it went through as a single bullet. The local attending physician applied an external remedy, until cicatrization took place, leaving a disfiguration. Later the author performed a lateral rhinoplasty, by the Indian method. It consisted in refreshing the borders obliquely, and dissecting from the pedicle up to the highest part of the detachment of continuity. To avoid infection of the flap by contact with the tears, he used a warm solution of boracic acid. After eight days he removed the stitches and noticed a great retraction of the flap, with a marked thickening in the center, which, below, did not cover by a centimeter the indentation produced by the tissue loss.

Later, other difficulties arose; the median and upper parts of the adherent flap were covered by heavy membranes, beginning at the root of the eyebrows, giving the patient a strange appearance. The author performed a second operation, making use of the thermocautery. It consisted in drawing a flap of muscle over the labial sulcus. The flap was inverted and sutured, covering the part of continuity, forming the ala of the nose.

Afterward, by means of two ellipsoid incisions, the back part of the nose was fixed, removing the heavy skins, which were implanted in the ellipsoidal cutaneous area. A rubber tube was placed in the nasal fossa to keep the aperture open and to prevent retraction. The wound healed well and the patient was entirely cured. RAOUL L. VIORAN.

THROAT

Sanger, F. D.: Some Phases of the Tonsil Question. *J. Ophth. & Oto-Laryngol.*, 1916, x, 5.

The commonly accepted assumption regarding the supposed function of the tonsil is strongly negatived by the fact that the tendency of the tonsil to infection exceeds that of any other organ of the body and as a portal of entry of infection into the body is a great menace not only to health but to life.

The economy attempts to eliminate the tonsil by sealing it in with adhesions as it does a foreign substance which constitutes a menace.

The tonsil resents no injury, thus differing from any other tissue in the body, and its tendency to regenerate harks back to the primitive type, being entirely out of consonance with the more highly organized tissues of the body. ELLEN J. PATTERSON.

Woods, R. H.: Tonsil Technique. *Illinois M. J.*, 1916, xxix, 30.

From an observation of over 2,000 tonsil cases at the Illinois Charitable Eye and Ear Infirmary, the author draws the following conclusions:

1. The tonsils if operated on at all, should be enucleated in their capsule.

2. Enucleations should be done by working between the planes, separating the capsule of the tonsil from its bed.

3. Keeping between the tissue planes is more easily accomplished with a blunt instrument than with a sharp one.

4. Any continued bleeding is dangerous and should be prevented.

5. All alarm and danger are reduced by placing hæmostats on bleeding points at the time of operation. OTTO M. ROTT.

Fischer, L.: Chronic Tonsillitis. *N. Y. M. J.*, 1916, ciii, 147.

The author emphasizes the fact that no case presenting gastric symptoms should be permitted to pass with such a diagnosis until a careful examination of the throat, tonsils, and adjacent glands is made, as there are many cases of chronic hypertrophic tonsillitis with frequent exacerbations of fever, headache, vomiting, and anorexia which may be mistaken for gastric or gastro-enteric derangement.

Urinalysis is an important diagnostic aid as many cases show albumin and all have acetonuria and diacetic acid.

Many of these patients suffer from inanition owing to the recurring febrile disturbances which deplete the body and are in danger of developing endocarditis or nephritis from repeated tonsillar infection. The treatment is surgical.

ELLEN J. PATTERSON.

Voislawsky, A. P., and Delavan, D. B.: The Removal of Diseased Tonsils by a Method Minimizing Hæmorrhage. *Med. Rec.*, 1916, lxxxix, 89.

The technique used by the authors is as follows: The patient under gas-ether anæsthesia lies prone upon the table with the mouth gagged to full capacity and the throat cleared of mucus by the Titus suction tongue depressor. A Beck snare is passed posterior to the right tonsil, the catch spring wire drawn tight and locked and the snare handed to an assistant. The left tonsil is engaged in a second snare and handed to an assistant. The snares are approximated and a tenaculum engages both tonsils. The assistant takes one snare, the operator the second, and slowly both tonsils are enucleated with a minimum amount of hæmorrhage, little traumatism, and very little pain following the operation.

Adult patients operated upon under local anæsthesia are given Magendie solution m. 7 with atropine sulphate gr. 1/150 one hour previous to operation. After cocainizing the mouth and pharynx, the operator injects novocaine in 0.5 per cent solution in the pillars and dissects the tonsils with a Robertson curved tonsil knife.

Surgical treatment of enlarged tonsils was advised as early as 10 A. D. by Celsus and 500 years later Aetius advised removal of the portion of the gland which projected. In the ages which followed up to the present time controversy has flourished and the interest of the profession in the subject "tonsillotomy versus tonsillectomy," has waxed and waned. In fact few operations have been so frequently performed, with a greater measure of benefit to the patient, and until recently, with less advancement in the positive scientific knowledge of the surgeon. ELLEN J. PATTERSON.

Israel, S.: The Suspension Laryngoscope (Killian); Its Aid in the Treatment of Tuberculosis and Syphilitic Lesions of the Larynx. *Texas St. J. Med.*, 1915. xi, 436.

Since a study of the literature relative to the frequency of laryngeal lesions in tuberculosis and lues reveals the fact that a large percentage of tuberculous patients, even in the incipient stage, and from 1 to 15 per cent of all cases of syphilis have laryngeal involvement more or less amenable to treatment and cure, it behooves the laryngologist to adopt a method of examining the larynx by which he can make an accurate diagnosis.

In the suspension laryngoscope of Killian the laryngologist has an apparatus with which he can see these lesions at close range; determine accurately their character and extent; and apply treatment conveniently.

Technique. The instrument is secured at one end of the tube, with the patient in the recumbent position, the head extending over the end, supported by an assistant. After anæsthetizing the base of the tongue, pharynx, and larynx, the spatula is introduced in the median line to engage the epiglottis and the spatula hook suspended upon the gallows. Thus the operator obtains an excellent view of the intralaryngeal space with little or no discomfort to the patient and has both hands free to apply treatment, medical or surgical. ELLEN J. PATTERSON.

MOUTH

Horsley, J. S.: Treatment of Cancer of the Tongue and Mouth. *Virg. M. Semi-Month.*, 1916, xx, 500.

There are two possible treatments of cancer.

The ideal procedure would be the injection of a serum whose action would inhibit the growth of neoplastic cells, or of a vaccine which would produce in the system antibodies inimical to such growth, or of a chemical which would destroy and inhibit the growth by its presence in the circulation and tissues. But experiments on lower animals which react to cancer as does man have developed no process of inhibition, immunization, or destruction by means that are of value clinically. The knife and the cautery are the chief, if not the only, treatment that offers salvation.

The extent of the excision beyond that necessary to the enucleation of the growth must depend upon the anatomy of the region involved. The operator will govern himself by the value to the system's economy of the organ or tissue involved, the near-

ness or remoteness of vital structures, the presumable ability to circumscribe, or tendency to permit of metastasis of the tissue in which the growth is found.

It is a general principle that cancer of the tongue and mouth should be excised in one mass wherever possible. The mucous membrane here is thin, offering little resistance to the cancer's inroads; the blood and lymphatic supply is rich. Hence, types of cancer that might remain stationary for years on the skin of the face pursue in this location a rapid and fatal course.

The author states that in the past four years he has operated upon 8 cases of squamous-celled cancer involving the tongue or mucous membrane of the mouth. All were advanced cases. The patients were white, 7 male, 1 female. Either pronounced involvement of the cervical glands or marked recurrence after previous operation or incision was noted in 7 cases, and 3 showed both. The ages varied from 46 to 81 years.

The operations were done under general anæsthesia induced either by inhalation or per rectum, and under local anæsthesia, cocaine, or novocaine. The advantages of rectal administration are obvious. It avoids the inconveniences of the mask, the danger of suffocation from aspirated blood, and the precautions necessary in the use of the cautery.

Excision of cancerous tissue *en masse* was done wherever possible. The cervical glands were removed in block dissection, clearing one or both submaxillary areas, or by the Crile operation beginning at the clavicle and dissecting up the sternomastoid muscle, internal jugular vein, and the neighboring tissues in one mass to the mastoid process. When possible, the primary growth was removed with the cautery, or the surface left after excision thoroughly cauterized. Where the large vessels of the neck forbade the use of the Paquelin cautery, the wounds were swabbed out with pure phenol followed by alcohol with the purpose of destroying loose cancer-cells. During the dissection the operated surface was frequently flushed with salt solution, also, to wash away these cells.

In two of the worst cases, the Percy cautery, which develops a low heat under electricity, was used. So far as the author knows, this is the first use of this method in cancer of the mouth. It was devised for and is chiefly used in uterine cancer.

The low heat makes a long application unnecessary, so that injury to surrounding healthy tissue may not occur, or the aspiration of hot air prove harmful. But where an external wound through which the cautery may be inserted exists, the author considers it admirable, superior even to a block dissection. Such conditions would be found in late recurrent cases or after extensive incision.

The cauterization should be continued at least thirty minutes. If the tissues are hard from old scar tissue, the Percy cautery is applied ten minutes and involved tissue is excised. A reapplication is then made, thus gaining penetration.

Of the author's 8 patients, 4 are dead: 2 of recurrences of the cancer, 1 of a pulmonary lesion undetermined, 1 of other causes than cancer but with a small recurrence present at time of death. Four are living, 1 with a recurrence and 3 without recurrence at periods varying from thirteen months to three years and eleven months.

The author holds that this series shows the disastrous results following the excision of a piece for microscopic section when the operation is deferred until later. Such examination should be by frozen section after the patient is prepared for operation, and the operation should be done at once should the microscopic findings indicate it. Any incision tends to spread the cancer markedly and rapidly. The region of the neck should be cleared by a block dissection, removing the tissues in one mass.

Whenever a preliminary excision of tissue is done for the purpose of examination and is not followed by immediate and radical operation, or where through error in diagnosis or planning of the operation incomplete enucleation of the growth or connected tissues is made, operation of the cancer or its recurrence has a very poor prognosis.

Of his 3 patients now living and well, none had any preliminary incision. Of the remaining 5, 4 of whom are dead and 1 living with a recurrence present, a preliminary incision or an incomplete operation was done on each at least several days before the radical operation. H. A. POTTS.

Ivy, R. H.: Relation of the Teeth to the Maxillary Sinus. *J. Ophth., Otol. & Laryngol.*, 1916, xxii, 32.

The author emphasizes the following points:

1. The possibility of infection from a dental source should never be ignored in a case of maxillary sinus disease.

2. The roots of the teeth in direct relation with the floor of the antrum of Highmore may be affected with apical disease in the absence of all ordinary symptoms and signs, the disease being demonstrable only by the X-ray.

3. The antrum is more frequently opened during the extraction of certain teeth than is generally supposed, there being a local absorption of the floor by the dental disease.

4. Considerable difficulty is sometimes experienced in differentiating the X-ray shadow of the maxillary sinus from the outlines of pathological cavities such as cysts and abscesses.

OTTO M. ROTT.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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